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# STEEL

PRODUCTION • PROCESSING • DISTRIBUTION • USE

FOR FORTY-EIGHT YEARS—IRON TRADE REVIEW

OR DEEP DRAWS

WITHOUT ANNEALING

NICKEL SILVER

THE shell at the left, a coffee urn lid in process, was drawn to a depth of 5¼" in a single draw, from a 20-gauge Seymour 18% soft Nickel Silver circle 21" in diameter. No giant press was used; the work was done on a No. 2½ Bliss Draw Press.

•

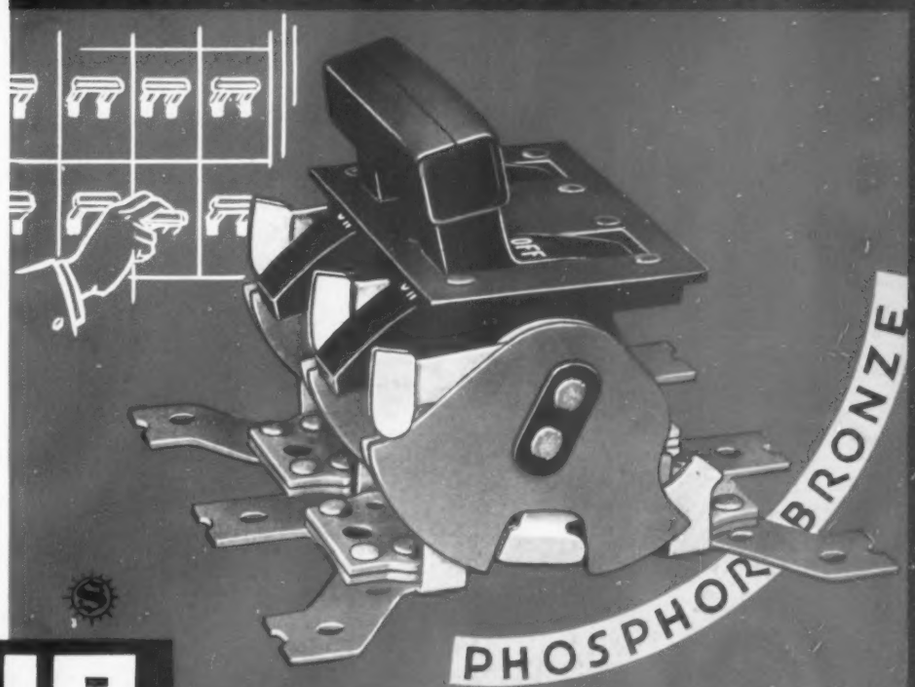
Absence of annealing, which softens a shell all over, is an advantage, as it preserves strength where strength is needed—at the top in this case.

•

Seymour Nickel Silver is a highly ductile alloy. In drawing or spinning, it flows smoothly without strain. Coming out free from splits and open pores, it usually avoids the grinding operation. Also an advantage is its silvery white color where the article is to be silver plated; when exposed by wear, it matches the surrounding plate.

FOR SWITCH CONTACTS

THAT MUST STAND FATIGUE




PHOSPHOR BRONZE

THE rotating assemblies in the 250-volt, 60-ampere heavy duty switch at the right are made of Seymour Phosphor Bronze because of its strong spring tension and good conductivity.

At each "ON" throw of the switch, these assemblies, composed of two plates, are driven into contact with terrific force by heavy coiled springs, the impact separating the plates to effect the grip on the contact plate. This grip must be sustained for many years; and, to make sure of it, the assemblies are put through a "fatigue" of 50,000 impacts! Evidence of the ability of Seymour Phosphor Bronze to stand such rigorous service is the fact that it is used for just such purposes by a very important part of the electrical industry.

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Incorporated in this machine are the features of all Heald Bore-Matics, and practically any operating cycle can be obtained, from simply boring at one end and loading at the other, to boring in both directions and facing at one end while loading at the other.

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THE HEALD MACHINE COMPANY, Worcester, Mass., U. S. A.

*New...*

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# STEEL

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*For forty-eight years—IRON TRADE REVIEW*

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The Composite Section has a base of soft steel which is readily drilled or machined after hardening and after locating the section in the die. In addition to a better fit this also eliminates the expensive hand lapping of dowell holes. Nor is it necessary to use the expensive back-up type of die construction.

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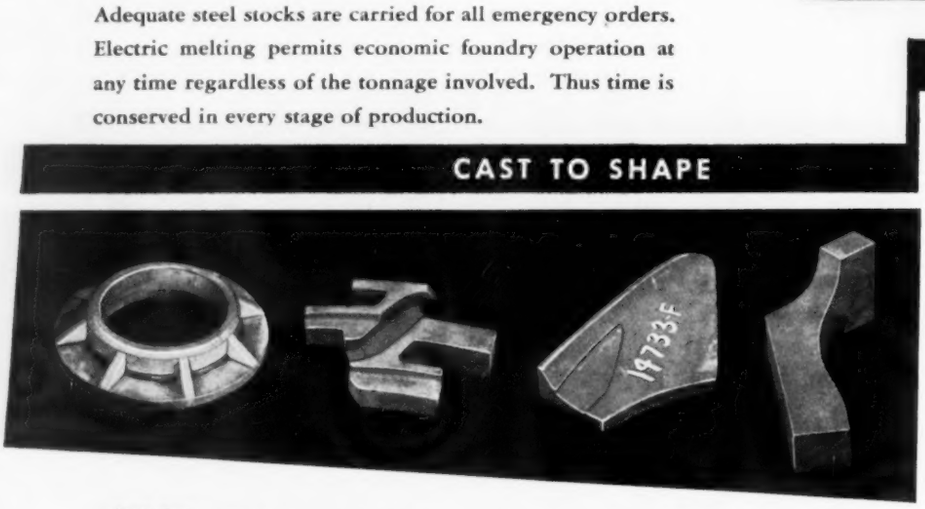


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# As the Editor Views the News

STEEL producers made a good showing in the first half, considering the handicaps. On the basis of reports from 15 leading companies having 86 per cent of the total ingot capacity (p. 14) the industry earned a profit of about $20,000,000. Compared with the first half of 1934, this is a gain of 13 per cent. The encouraging increase was achieved in spite of a decline of 2 per cent in ingot production. This may be construed as an indication that steel companies are functioning more efficiently. Another plausible explanation is that steel producers are concentrating on and pushing the more profitable products more intelligently.

• • •

**U. S. Drops Nuisance Suit**

The campaign against bigness has suffered at least one defeat. Attorney General Cummings declared Friday (p .15) that the government will not appeal its case against the merger of Corrigan, McKinney Steel Co. with Republic Steel Corp. The haphazard manner in which the government presented its suit gave rise to doubt in some quarters as to whether the action was prompted by a sincere belief that the antitrust laws were being violated or by the passionate desire of anti-business new dealers to harass an important industrial corporation. Meanwhile the brain trust brigade relies upon its tax program (p. 22) to continue its barrage against bigness.

• • •

**Driving from the Back Seat**

An interesting point in connection with the benefits of alleged "co-operation" between government and business has been raised in the automobile industry. Perhaps the only major concession made by motordom to the new deal was the agreement to introduce new models in the fall of 1935 instead of early in 1936. Now that concession seems to be working a hardship (p. 19) on motor car manufacturers. It may cost them thousands of potential sales of 1935 models and introduce much unnecessary confusion. Doubtless there will be repercussions in many directions before the effects of the concession are fully realized. The experience of this and many other experiments in back seat driving by the new deal may ultimately teach us that the old adage, "Less government in business and more business in government" is worth heeding.

• • •

**What Accuracy Means Today**

It is almost impossible to exaggerate the importance of accuracy in mass production operations to the comforts and conveniences of modern living. Automobiles go 50,000 miles or more before it becomes necessary to touch the valves. Their transmissions are long-lived and trouble-proof. Mechanical refrigerators, washing machines, etc. operate year after year with small need for repairs or maintenance. Such remarkable performance is due largely to the fact that the parts in today's mechanical appliances are machined to close tolerances. That 1935 machine tools permit accuracy never before possible in manufacturing on a production basis (p. 42) is one reason why manufacturers cannot afford to face today's competition with obsolete equipment.

• • •

**Requires Skill and Ingenuity**

Accuracy of a different kind, but no less remarkable, was obtained in the machining and assembling of the polar axis (p. 20) of a reflecting telescope for the University of Texas. To turn out work of this nature to within an allowable error of less than 0.001 inch in the alignment of bearings 24 feet apart is a noteworthy accomplishment. Here the elements of human skill and ingenuity play a more important part than the proficiency of the machine. . . . About 350 tons of galvanized sheets, a small tonnage of 4 x 4-inch angles and 350 tons of cast iron counterweights—a curious combination of materials—went into the bifolding doors (p. 35) for Pier 88, New York, which was built to accommodate the new French liner NORMANDIE.

E. L. Shaner

# Steel's First Half Showing: Output Off 2%, Profits Up 13

FIFTEEN leading producers of steel representing 58,714,700 tons of ingot capacity, or 86 per cent of the country's total, report in the aggregate a profit of $17,930,608 for the first half of 1935.

Assuming the experience of these 15 to be typical, the indicated net for the entire industry for the first half year is $20,800,000. In the first half of 1934 the identical 15 producers reported earnings of $16,237,171, making the indicated profit for that period $18,850,000.

### More Profit Per Ton

Production of steel ingots in the first half year was 16,024,691 tons, compared with 16,402,554 a year ago. Indicated profit per ton of steel produced in the first half year thus is $1.23, against $1.15 a year ago.

This showing of an improvement of 13 per cent in profits in a six months when output was down 2 per cent is ascribed, primarily, to the ascendancy of alloy steels and the light, flat-rolled products, and to more efficient operations.

Considering steel a four billion dollar industry, the first half net indicates an annual return of about 1.04 per cent. Last year the return was 0.33 per cent before dividends and bond interest.

Of these 15 important steelmakers, four were in the red in the first half of 1935, compared with only two last year. However, nine improved their position over a year ago. From the first to the second quarter of this year, only six showed betterment financially.

Biggest moneymaker in the first half year, regardless of size or any condition, was the National Steel Corp., which reported a profit of $6,558,802. Second was the Inland Steel Co. with a net of $4,858,307. Third was the Republic Steel Corp., $2,756,564, closely followed by American Rolling Mill Co., $2,459,003.

A spotty situation exists when the results of both the second quarter and the first half year are considered. For example, the United States Steel Corp. reduced its deficit in the second quarter to one third what it was in the first quarter, but its first half year showing is poorer than a year ago. The same is true of Bethlehem.

Republic's second quarter was not so good as its first, but its half is a distinct improvement over a year ago. Jones & Laughlin shows betterment all along the line, going into the black in the June quarter, and in the first half more than halving the deficit of last year. Sheet & Tube also turned in a better report.

Following are details on some of the larger steelmakers:

### YOUNGSTOWN SHEET & TUBE CO.

| | |
|---|---|
| Gross income after deducting charges for repairs and maintenance of plants, and provisions for estimated federal taxes | $3,000,057 |
| Deduct: interest for quarter | 1,084,650 |
| Profit before miscellaneous charges and depreciation and depletion | $1,915,407 |
| Deduct: miscellaneous charges including expense of carrying and upkeep of idle plants, mines and other properties | 415,964 |
| Profit before depreciation and depletion | $1,499,441 |
| Depreciation and depletion | 1,374,682 |
| Profit for quarter | $124,758 |

Preferred dividend payable July 1, 1935, amounting to $206,250 was not paid. Total preferred dividends in arrears amount to $2,681,250.

### INLAND STEEL CO.

| | | |
|---|---|---|
| Net income after deducting administration expense and all charges for repairs and maintenance | | $4,148,423 |
| Deduct: interest on bonds | $445,500 | |
| Depreciation and depletion | 928,414 | |
| Estimated federal taxes | 382,000 | |
| | | 1,755,914 |
| Net profit for quarter | | $2,392,509 |

### COLORADO FUEL & IRON CO.

| | Quarter Ending June 30, 1935 |
|---|---|
| Total earnings, after deducting operating expenses (including repairs and maintenance and general taxes) and selling, administrative and general expenses | $382,943 |
| Interest and other miscellaneous income | 63,624 |
| Total income | $446,567 |
| Less: interest on bonds (see note) | 56,250 |
| Balance | $390,317 |
| Provision for depreciation of plants and exhaustion of minerals | 342,765 |
| | $ 47,552 |
| Provision for federal income tax | 24 |
| | $ 47,528 |

Pursuant to orders of court entered in receivership proceedings, cash has heretofore been deposited with the paying agent for the payment of the interest on Colorado Fuel & Iron Co.

## General Trend of Iron and Steel Producers, Financially, Is Upward

All figures are earnings, except where asterisk denotes deficit

| | Second Quarter 1935 | First Quarter 1935 | Second Quarter 1934 | First Half 1935 | First Half 1934 | Ingot Capacity gross tons |
|---|---|---|---|---|---|---|
| United States Steel Corp. | $ 762,493* | $2,173,801* | $5,350,241 | $2,936,294* | $1,639,724 | 27,341,900 |
| Bethlehem Steel Corp. | 1,800,909 | 607,298* | 3,441,642 | 1,193,611 | 2,539,598 | 8,980,000 |
| Republic Steel Corp. | 922,329 | 1,834,235 | 864,125 | 2,756,564 | 805,443 | 5,013,000 |
| Jones & Laughlin Steel Corp. | 44,412 | 794,789* | 886,252 | 750,377* | 1,924,524* | 3,671,200 |
| Youngstown Sheet & Tube Co. | 124,758 | 595,770* | 1,012,207 | 471,011* | 411,261* | 3,120,000 |
| American Rolling Mill Co. | 1,087,529 | 1,371,474 | 1,472,879 | 2,459,003 | 2,018,148 | 1,807,600 |
| National Steel Corp. | 3,191,169 | 3,367,633 | 2,593,629 | 6,558,802 | 4,235,697 | 2,232,000 |
| Inland Steel Co. | 2,392,510 | 2,455,797 | 2,129,197 | 4,858,307 | 3,233,734 | 2,000,000 |
| Wheeling Steel Corp. | 668,300 | 934,571 | 1,134,511 | 1,602,871 | 1,076,178 | 1,500,000 |
| Colorado Fuel & Iron Co. | 47,527 | 41,490 | 369,419 | 99,017 | 642,460 | 888,000 |
| Otis Steel Co. | 435,493 | 952,362 | 524,725 | 1,387,855 | 1,177,614 | 872,000 |
| Sharon Steel Hoop Co. | ..... | ..... | ..... | 540,866 | 436,671 | 450,000 |
| Gulf States Steel Co. | 66,662* | 30,148 | 201,616 | 36,514* | 191,803 | 401,000 |
| Granite City Steel Co. | 177,792 | 134,581 | 218,686 | 312,373 | 200,245 | 400,000 |
| Ludlum Steel Co. | 147,014 | 198,521 | 228,774 | 345,535 | 375,641 | 38,000 |
| Superior Steel Corp. | 31,289* | 38,511 | 5,676* | 6,682 | 11,942* | ..... |
| Acme Steel Co. | 338,348 | 601,990 | 594,790 | 935,338 | 881,378 | ..... |
| Virginia Iron, Coal & Coke Co. | 29,555* | 8,950 | 46,377* | 20,605* | 46,426* | ..... |

general bonds, which became due Aug. 1, 1933; Feb. 1, 1934; Aug. 1, 1934; Feb. 1, 1935, and which will become due Aug. 1, 1935.

**BUDD GETS $5,000,000**

A loan of $5,000,000 to the Edward G. Budd Mfg. Co., Philadelphia under provisions of section 13b of the federal reserve act has been approved. This will relieve the situation in regard to holders of debentures and provide the company with working capital. Says the company: "We anticipate a growing demand for streamlined, light-weight, high-speed railroad equipment." Budd has used stainless steel, welded, extensively.

**DIVIDENDS DECLARED:**

Inland Steel Co., 50 cents and extra of 25 cents on the common, payable Sept. 3 to record of Aug. 15.

Allegheny Steel Co., 25 cents on the common payable Sept. 14 to record of Aug. 31, and $1.75 on the preferred payable Sept. 1 to Aug. 15 record.

**See also Page 90**

## New Capacity

UNITED STATES STEEL CORP. executives have approved an expenditure by the Carnegie Steel Co. to install a modern wide plate mill at its Homestead steelworks, Munhall, Pa., to roll sheared plates up to 90 inches wide and down to 3/32-inch thick, of standard and special grades, including wide, thin plates of Cor-Ten steel.

# To Speed Republic-Corrigan Merger as Govt. Drops Suit

REPUBLIC STEEL CORP. and Corrigan, McKinney Steel Co. will be merged immediately. This was announced jointly Friday by Tom M. Girdler, chairman-president of Republic, and Donald B. Gillies, president of Corrigan-McKinney, following the decision of the department of justice at Washington not to prosecute further its action to halt the merger.

In the autumn of 1934 negotiations between the two important producers of steel were concluded, and on Aug. 27 terms were announced. Rumblings of government displeasure, based upon fear that section 7 of the Clayton act was being violated, developed into suit brought by the department of justice Feb. 7, 1935.

**"Submitted to Scrutiny"**

By agreement, argument on a temporary injunction was dispensed with, all merger activity was suspended, and the case was tried on its merits for a permanent injunction. Last May 3 Federal Judge Fred M. Raymond, of Grand Rapids, Mich., decided decisively in favor of the steel companies. On Friday, in Washington, Attorney General Cummings announced that no appeal would be taken. He said:

"This case was brought in order that the agreement should be submitted to judicial scrutiny. It is fully tried and the court pronounced the transaction legal."

This had a sequel in the joint statement of Messrs. Girdler and Gillies:

"We are gratified with the position taken by the department of justice. Steps will be taken immediately looking to consummation of the merger."

Presumably, in the meantime, plans for effecting the consolidation have been matured, and an announcement concerning the attendant changes in personnel, sales and operating situations will be forthcoming shortly.

To the merger, in which Republic will be dominant, Corrigan-McKinney brings its Cleveland plant with 4 blast furnaces, 204 coke ovens, 14 open-hearth furnaces, semifinished, bar and strip mills, and upward of 50,000,000 tons of iron ore reserves. Its annual capacities include 1,200,000 tons of pig iron, 1,116,000 tons of ingots, 911,000 tons of coke, and 324,000 tons of hot-rolled products. Its affiliated Newton Steel Co., at Monroe, Mich., and Newton Falls, O., has an annual capacity of 340,000 tons of sheets.

**Truscon Comes Into Picture**

Republic's annual ingot-making capacity thus will be increased from 5,013,000 tons to 6,129,000 tons, but this will not change its rank; it will remain the third largest producer. Republic's operating headquarters are at Youngstown, O., although Mr. Girdler and other executives have offices in Cleveland.

Probably the first formal step in effecting the merger will be a stockholders' meeting of Republic, which has been postponed at various times since last Oct. 30. After the Republic-Corrigan amalgamation is consummated, the acquisition of the Truscon Steel Co., Youngstown, will be undertaken. Last fall directors of both Corrigan-McKinney and Truscon ratified their respective consolidations.

Fixed properties of Corrigan-McKinney on June 30, 1934, were valued at $51,000,000 after depreciation, subject to $3,075,000 bonds of

## United States Steel Corp. Still in Red, but Loss Shrinks

| | Quarter ending June 30, 1935 | Six months ending June 30, 1935 |
|---|---|---|
| Earnings and income after deducting all expenses, including ordinary repairs and maintenance, also estimated state, local and federal taxes and reserves for contingencies, but exclusive of charge for proportion of overhead expenses and taxes shown below | $14,117,864 | $26,546,313 |
| Charges and allowances for depletion, depreciation and obsolescence | 11,350,272 | 22,745,452 |
| Net income | $ 2,767,592 | $ 3,800,861 |
| Interest charges on outstanding bonds and mortgages: | | |
| Of subsidiary companies | 1,246,723 | 2,500,431 |
| Of United States Steel Corp. | 3,362 | 6,724 |
| Net income from operations | $ 1,517,507 | $ 1,293,706 |
| Add proportion of overhead expenses (of which taxes alone are approximately 90 per cent) of the Lake Superior iron ore properties and Great Lakes transportation service, normally included in the value of the season's production of ore carried in inventories, but which because of curtailment in tonnage of ore to be mined and shipped in 1935 is not so applied | 2,280,000 | 4,230,000 |
| Deficit | $ 762,493 | $ 2,936,294 |
| Dividends on stock of United States Steel Corp: | | |
| *Quarter ending June 30, 1935 (Pfd. ½ per cent) | 1,801,405 | ..... |
| Six months ending June 30, 1935 (Pfd. 1 per cent) | ..... | 3,602,810 |
| Total deficit provided from undivided surplus | $2,563,898 | $ 6,539,104 |

*Dividend payable: Preferred, Aug. 30, 1935; to stockholders of record Aug. 2, 1935.

**Shipments of Finished Steel Products**

| | |
|---|---|
| For the quarter ending June 30, 1935 | 1,768,751 tons |
| For the six months ending June 30, 1935 | 3,553,999 tons |

a subsidiary. Consolidated current assets were $12,000,000 and consolidated current liabilities $3,500,000, in addition to a $2,000,000 note.

Originally, Republic offered to assume all Corrigan-McKinney liabilities and deliver these securities: $15,361,000 of 5½ per cent 20-year purchase money bonds, 27,929 shares of new prior preference stock and 698,223 shares of common.

Republic offered Truscon shareholders two shares of Republic common and one-half share of prior preference for each share of Truscon preferred, and 4/10 share of common for each Truscon common share.

Republic is expected to go through with its recapitalization program, including the issuance of new prior preference stock, each share of present preferred to be exchanged for one half share of the new preferred and two common shares. The sale of $24,000,000 of convertible bonds was originally contemplated. It is believed the new program will be largely the old one, adjusted to meet changes in the financial situation in the meantime.

# Continuous Assembly of Locomotives Possible in Electro-Motive Plant

LARGEST complete unit to be built in several years for the manufacture of heavier durable goods, the new plant of the Electro-Motive Corp., a subsidiary of General Motors Corp., has several other features which make it an outstanding industrial development. The Austin Co., Cleveland, is erecting the plant, now about half completed, on a 70-acre site at McCook, Ill., a Chicago suburb.

This is the first plant to be built for the mass production of diesel-electric locomotives. It has been designed so that locomotives will take form as they move crosswise in a 104-foot aisle which extends for a distance of more than 500 feet. The production line will resemble that of a modern automobile plant, with 24 construction bays, into which frames, parts and engines will be moved with the aid of one 200-ton and two 30-ton electric traveling cranes.

Principal difference between the Electro-Motive plant and the latest automobile factories is that interruption of production at any point along the locomotive line will not affect the work at other stations. This is due to the fact that the work moves on cranes overhead instead of on a carrier belt.

Welding plays a prominent part in the fabrication of the building and certain equipment. All structural steel — more than 2000 tons — is being electrically welded on the job by The Austin Co. The big 200-ton traveling crane not only is the largest ever to be built entirely by welding, but also is the heaviest — 205 tons — to be operated on a welded structure. It is a product of the Cleveland Crane & Engineering Co., Wickliffe, O. Two 20-ton cranes will serve the machine shop which extends alongside the main aisle. This shop is 64 x 550 feet.

Other buildings in the group include: Main office building, three stories high and equipped for air conditioning, 40 x 140 feet; employment office, 15 x 30 feet; blacksmith shop, 70 x 75 feet; annealing ovens, 22 x 200 feet; sand blast building, 30 x 150 feet; paint shop, 50 x 140 feet; warehouse, 48 x 140 feet; power house, 40 x 60 feet.

### Self-Contained Utilties

An unusual feature of the plant is that it will be independent of public utility services. A complete water supply system is being installed, with a 1600-foot well and a 200,000 gallon reservoir. Power will be provided by one of the latest model diesel-electric units designed for locomotive use. A sewage disposal plant also is being built.

Annealing ovens extend 200 feet on the opposite side of the main structure from the machine shop and are designed to accommodate the entire frame of the largest locomotive at one heat. Special testing pits for the locomotives will be provided.

In its entirety the plant represents the first large industrial project completely designed in the modern manner. Unbroken bands of horizontal windows surround the principal buildings without interruption by exterior columns, which are enclosed inside the glass even at the corners.

Electro-Motive Corp. will turn out finished locomotives at this plant, though the diesel engines will be furnished by the Winton Engine Co., Cleveland, another General Motors subsidiary.

*George A. Bryant Jr., executive vice president, Austin Co., left, and W. J. Austin, president, center, visit the project now under construction by their company for the Electro-Motive Corp., General Motors subsidiary, which will begin the manufacture of diesel-electric locomotives on a mass production basis about Nov. 1. They are shown with H. L. Hamilton, president, Electro-Motive Corp., studying plans which will permit quadrupling the McCook, Ill., plant*

# Labor

EMPLOYMENT in the steel industry in June was maintained at 98.9 per cent of the May level despite an 8.6 per cent drop in production, according to the American Iron and Steel institute.

The announcement covered the first month of operations in the steel industry since the ending of the steel code, and reports were made voluntarily to the Institute by members of the industry in accordance with their previously-announced decision to continue to report data on employment, hours and wages in the future as in the past under the code.

The industry employed 416,732 in June, compared with 421,470 in May. Operations in June, however, were at 40.31 per cent of capacity as against 44.10 per cent in May. Employment in June, 1935, was only 8.6 per cent below June, 1934, despite the fact that operations last month were 24.6 per cent below a year ago.

Average earnings per hour of employes receiving hourly, piecework or tonnage wages were 65.1 cents, a de-

cline of only 6/10 of 1 per cent from the average earnings of 65.5 cents per hour in May. In June, 1934, wage-earning employes received an average of 63.9 cents per hour.

The comparatively low rate of operations in June reduced the average number of hours worked per week by such employes from 33.9 in May to 31.4 in June. This compares with the average of 35.7 hours worked weekly in June of last year. June, 1935, payrolls were $41,902,874, compared with $46,493,536 in May when operations were at a higher level. Payrolls in June, 1934, were $49,466,644; in that month operations were at 53.44 per cent.

**SIGN FOR N. Y. SCRAP CODE**

Seventy-five scrap iron dealers have signed the voluntary labor code of the Institute of Scrap Iron and Steel for the New York market. There are only five qualified scrap iron dealers in New York who have not yet signed, but it is expected that 100 per cent compliance will be secured in the entire New York market within the next few days. The labor code provides for a 45-hour week, a minimum wage of 40 cents per hour, with 56 cents per hour for truckdrivers, and Saturday closing.

**JUNE UNEMPLOYMENT GROWS**

Unemployment in June was 9,804,000 persons, an increase of 95,000 over May but a decrease of 552,000 from June, 1934, states the National Industrial Conference board, New York.

## Housing

GENERAL Electric Co., Schenectady, N. Y., has organized a subsidiary—Houses Inc.—for co-operating in house-building "of all worthy types," its primary concern being the interior mechanism of the house. Charles E. Wilson, vice president of General Electric, is chairman; Foster Gunnison is president; James L. Hagar and J. A. Olson are vice presidents. Offices are at 570 Lexington avenue, New York.

General Electric is interested in modern housing because it absorbs an increasingly large amount of electric materials and appliances, it supplies a demand for power, and it contributes to social improvement and general economic recovery.

## Tariff

HORSESHOE and Allied Products Manufacturers association, New York, has filed an application with the tariff commission, Washington, asking for an increase on the duty of wrought iron or steel horse and mule shoes. The duty in the tariff act of 1930 is 1/5c per pound.

# Industrial Building Is Potent Factor in July Steel Tonnage

STEEL production in July closely approximated that of June, one of the few instances in the past 15 years.

With the last three days of the month estimated, the steelworks operating rate for the month was 39.9 per cent, less than one-half a point under the official 40.3 per cent for June.

From 1920 on, daily average steel ingot production in July exceeded that of June in only one year—1928—and in only two years, 1922 and 1923, did it come close to June. These two years were strong recovery years following the depression of 1921.

While the July figures for many leading steel consuming industries are not yet available for similar comparison, the record of steel production undoubtedly is a reflection of a general improvement, which has followed on greater employment and marked increase in farm purchasing power.

One of the unusual developments in July was the gain in industrial and commercial building construction, indicating the improvement has taken firm root. STEEL's records of structural shape awards for the month show a total tonnage 4 per cent heavier than in June.

This was accomplished without any steel being awarded under the government's $4,800,000,000 works relief program, and after completion of many projects which were started in 1934 and early in 1935. It was due mainly to the increase in private construction.

STEEL's record includes only awards of 100 tons or more for a project, but steel fabricators report a considerable expansion in the smaller types of buildings, and in reconstruction.

In the first four full weeks of July 20,838 tons of structural steel was awarded in 100-ton or larger projects for industrial and commercial buildings. This included such tonnages as 1900 for the American Rolling Mill Co.'s strip mill building, Middletown, O., and 2150 for a building for the Union Bag & Paper Co., Savannah, Ga. Commercial buildings were represented by 1150 tons for a store and theater building in New York, and 1050 tons for an apartment building in that city.

The apartment was the first important award of such a building in many months. The first project for a skyscraper since the beginning of the depression was launched in Chicago recently, and in July the general contract was placed for a 10-story office building in San Francisco, requiring 1000 tons of reinforcing bars.

**Industry Is Building**

The steel industry itself has been a leader in construction work this year. In April the Great Lakes Steel Corp. awarded 16,000 tons of shapes for a strip mill in Detroit, which increased the industrial-commercial tonnage for that month to 18,327 tons.

In March, the Bethlehem Steel Co. placed 10,000 tons for a sheet mill in Lackawanna, N. Y. (Buffalo), and the total of industrial-commercial awards for that month was 12,572 tons.

In the first 27 days of July, 36 industrial-commercial projects were closed. The month of June had 41, although the amount of steel awarded was only 11,526 tons, compared with 20,838 tons for the 27-day period in July.

All industrial-commercial steel awards this year to July 27 totaled 96,064 tons, or 22 per cent of the

(*Please turn to Page* 91)

## Dawes Points with Pride

*SAID General Charles G. Dawes, former vice president, as quoted in* STEEL, *Dec.* 17, 1934, *page* 17*:*

*"Not later than June or July of next year* (1935) *should be the beginning of the great sustained demand for durable goods, due to the accumulation for five years of postponed demands, and this time should also mark the commencement of the year of full business prosperity in the country."*

*Said the general, as quoted in* STEEL, *Jan.* 21, 1935, *page* 14*:*

*"The present rapid and continuing rise in the mass demand for heavy durable goods is a natural and not a forced rise, and it is a rise which always marks the end of a major depression."*

*July* 19, 1935, *the general, returning from a fishing trip in Wyoming is quoted as saying:*

*"The nation is at the beginning of the first full year of business recovery. Note the growing demand for durable goods, larger bank clearings, increase in electrical production, and improvements in the automobile and other industries."*

# July Iron Production Drops Slightly: 1 More Stack In

ALTHOUGH production of coke pig iron in the United States suffered a small loss in July, output for 1935 again regained the lead over 1934 after having relinquished it in June. Production this year is holding a comparatively steady gait, while a year ago it went into a precipitate decline in the summer months.

Notwithstanding the fact that both total output and average daily output registered losses in July, 92 blast furnaces were operating on July 31, as compared with 91 on June 30. The drop in tonnage, therefore, is attributable to the widespread practice of operating stacks on slack blast or banking for short periods.

Average daily production in July was 49,033 gross tons, which, compared with the daily rate of 51,949 tons in June, was a decrease of 2916 tons, or 5.6 per cent. This was the lowest rate since January with 47,692 tons. In July, 1934, the daily rate was 39,630 tons.

**AVERAGE DAILY PRODUCTION**

Gross Tons

| | 1935 | 1934 | 1933 | 1932 |
|---|---|---|---|---|
| Jan. | 47,692 | 39,537 | 18,348 | 31,336 |
| Feb. | 57,675 | 45,385 | 19,752 | 33,122 |
| Mar. | 57,120 | 52,438 | 17,484 | 31,194 |
| Apr. | 55,719 | 57,873 | 20,786 | 28,524 |
| May | 55,986 | 66,370 | 28,784 | 25,282 |
| June | 51,949 | 64,563 | 42,165 | 20,867 |
| July | 49,033 | 39,630 | 58,108 | 18,394 |
| Aug. | | 34,199 | 59,137 | 17,035 |
| Sept. | | 29,969 | 50,264 | 19,788 |
| Oct. | | 30,689 | 43,824 | 20,795 |
| Nov. | | 31,930 | 36,124 | 20,858 |
| Dec. | | 33,161 | 38,456 | 17,650 |
| Ave. | 53,537 | 43,774 | 36,223 | 23,699 |

Total output for the month was 1,520,016 tons, a loss of 38,447 tons, or 2.4 per cent, from the 1,558,463 tons made in June. This loss was in spite of the fact that July was a one-day longer month than June. The July production was the lowest since January with 1,478,443 tons; in July, one year ago, it was 1,228,544 tons.

For the 7-month period, 1935 production has aggregated 11,349,950 gross tons, against 11,081,152 tons for the corresponding period of 1934, an increase of 268,798 tons, or 2.4 per cent. The 1933 7-month total was 6,246,095 tons.

Relating production to capacity, July had an operating rate of 35.2 per cent, as compared with 37.2 per cent in June, 34.2 per cent in January, and 28.4 per cent in July, 1934.

The 92 operating blast furnaces on July 31 compared with 91 in June, 96 in May, 97 in April, 97 in March, 96 in February and 89 in January. In July, 1934, operating stacks totaled 74, having dropped from 92 on June 30 and 117 on May 31.

**MONTHLY IRON PRODUCTION**

Gross Tons

| | 1935 | 1934 | 1933 |
|---|---|---|---|
| Jan. | 1,478,443 | 1,225,643 | 568,785 |
| Feb. | 1,614,905 | 1,270,792 | 553,067 |
| Mar. | 1,770,990 | 1,625,588 | 542,013 |
| Apr. | 1,671,556 | 1,736,217 | 623,606 |
| May | 1,735,577 | 2,057,471 | 892,326 |
| June | 1,558,463 | 1,936,897 | 1,264,953 |
| July | 1,520,016 | 1,228,544 | 1,801,345 |
| Tot. 7 mo. | 11,349,950 | 11,081,152 | 6,246,095 |
| Aug. | | 1,060,187 | 1,833,265 |
| Sept. | | 899,075 | 1,507,931 |
| Oct. | | 951,353 | 1,358,540 |
| Nov. | | 957,906 | 1,083,740 |
| Dec. | | 1,028,006 | 1,192,136 |
| Total | | 15,977,679 | 13,221,707 |

During July, 7 furnaces resumed and 6 were blown out or banked. Of the steelworks or nonmerchant group, 6 resumed and 2 were removed from operation; of the merchant group, 1 was blown in and 4 were blown out.

Furnaces resuming in July were: In Ohio: River No. 4, Corrigan, McKinney Steel Co. In Pennsylvania: Monongahela No. 1, National Tube Co.; one Aliquippa, Jones & Laughlin Steel Corp. In Alabama: City No. 2, Sloss-Sheffield Steel & Iron Co. In Michigan: Benson, Ford Motor Co. In Indiana: Gary No. 2, Illinois Steel Co. In Illinois: South Works New No. 10, Illinois Steel Co.

Stacks blowing out or banking were: In Ohio: Hubbard No. 1, Youngstown Sheet & Tube Co. In Alabama: Fairfield No. 6, Tennessee Coal, Iron & Railroad Co.; Pioneer No. 1, Republic Steel Corp.; Woodward No. 3, Woodward Iron Co.; City No. 1, Sloss-Sheffield Steel & Iron Co. In Illinois: South Works New No. 6, Illinois Steel Co.

With American Steel & Wire Co. announcing the dismantling of two of its four Central furnaces in Cleveland (STEEL, July 22, page 11), the number of potential units in the United States is reduced from 272 to 270. The units being torn down, stacks A and C, had an annual capacity 356,000 tons of basic and bessemer pig iron.

**JULY IRON PRODUCTION**

| | No. in blast last day of July | No. in blast last day of June | Total tonnage Merchant | Total tonnage Nonmerchant |
|---|---|---|---|---|
| Ohio | 25 | 25 | 80,931 | 355,347 |
| Penna. | 28 | 26 | 30,504* | 366,236* |
| Alabama | 4 | 7 | 49,932 | 34,928 |
| Illinois | 7 | 7 | 42,455 | 96,777 |
| New York | 7 | 7 | 46,029 | 69,910 |
| Colorado | 1 | 1 | | |
| Indiana | 7 | 6 | 11,047* | 207,794 |
| Maryland | 3 | 3 | | |
| Virginia | 1 | 1 | | |
| Kentucky | 2 | 2 | | |
| Mass. | 0 | 0 | | |
| Tennessee | 0 | 0 | | |
| Utah | 1 | 1 | ..... | 128,126 |
| West Va. | 2 | 2 | | |
| Michigan | 4 | 3 | | |
| Minnesota | 0 | 0 | | |
| Missouri | 0 | 0 | | |
| Total | 92 | 91 | 260,898* | 1,259,118* |

*Includes ferro and spiegeleisen.

**RATE OF OPERATION**

(Relation of Production to Capacity)

| | 1935[1] | 1934[2] | 1933[3] | 1932[4] |
|---|---|---|---|---|
| Jan. | 34.2 | 28.3 | 13.3 | 22.1 |
| Feb. | 41.4 | 32.5 | 14.3 | 23.4 |
| Mar. | 41.0 | 37.5 | 12.7 | 22.0 |
| Apr. | 40.0 | 41.4 | 15.1 | 20.2 |
| May | 40.2 | 47.5 | 20.9 | 17.9 |
| June | 37.2 | 46.3 | 30.6 | 14.7 |
| July | 35.2 | 28.4 | 42.4 | 13.0 |
| Aug. | | 24.5 | 42.8 | 12.0 |
| Sept. | | 21.5 | 36.4 | 14.0 |
| Oct. | | 22.1 | 31.8 | 14.7 |
| Nov. | | 22.8 | 26.2 | 14.7 |
| Dec. | | 23.7 | 27.9 | 12.5 |

[1]Based on capacity of 50,845,741 gross tons, Dec. 31, 1934; [2]capacity of 50,975,561 tons, Dec. 31, 1933; [3]capacity of 50,313,975 tons, Dec. 31, 1932; [4]capacity of 51,598,175 tons, Dec. 31, 1931. Capacities by American Iron and Steel institute.

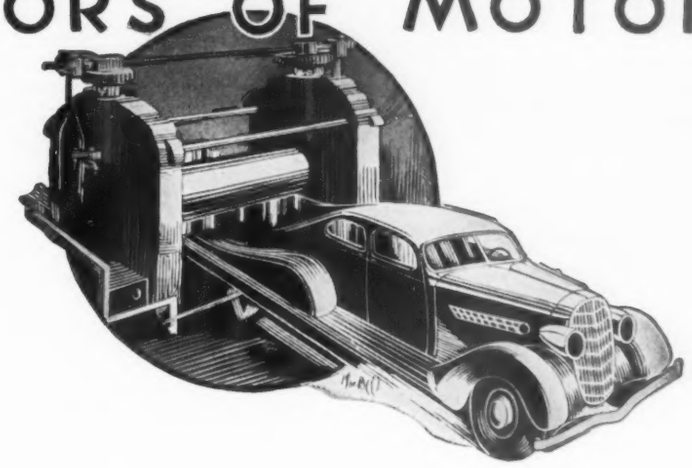
## Bucyrus-Erie "Open House" Aids South Milwaukee Fete

More than 6500 men, women, and children were ushered through the various shops of the South Milwaukee, Wis., plant of Bucyrus-Erie Co., leading manufacturer of excavating, drilling and material handling equipment at an "open house" July 20 in conjunction with South Milwaukee's 100th anniversary celebration.

Of special interest to visitors was one of the four large caterpillar trucks for a 950-B shovel, now in the process of being built, which ran back and forth powered by its own individual electric motor. When completed, the excavator will weigh some 2,000,000 pounds and operate with a 30-cubic yard dipper, the largest ever made.

Among other products shown in operation were a Bucyrus-Erie 10-B streamlined ⅜-cubic yard shovel, a Bucyrus-Armstrong water well drill, and a bit dresser. A 200-ton locomotive crane and a CT-50 loadmaster attracted attention, as did other excavating, drilling and material handling machines.

# MIRRORS OF MOTORDOM



*DETROIT*

ITS only major concession to the new deal is working a hardship on the automobile industry. The agreement to introduce new models within 60 days of Oct. 1, or between Aug. 1 and Dec. 1, and to advance the New York show to Nov. 2 is proving a distinct handicap.

Take for example the situation of one manufacturer of low-price cars, who is now operating not far from capacity. On the books are retail orders which are the equivalent of almost eight weeks' production. Some time ago it planned to change over to 1936 models about Sept. 1.

Now, to adhere to this schedule this maker either will have to cancel some of these orders or try to switch them over to the new line. The latter is not so easy to do, for even on the same financial terms a surprisingly large number of buyers prefer the last car off the line of a current series to the first of the new one.

It would be better for this manufacturer, both in point of volume and profits for 1935, to run along with the present line several months more, but it has to think of its competitors. They, in turn, are in somewhat similar positions, but none dares wait too long in bringing out new models for fear of lagging behind the procession. In degree, much the same holds true for medium-price car manufacturers.

### Time Proving Precious

Hence the problem of the industry is how to bridge the gap between 1935 and 1936 models with a minimum loss of time. Retail sales continue strong—in fact, they have gained slightly—and the prospect of good crops indicates a strong rural market just ahead. No manufacturer can afford to let its dealers' floors be empty and to miss the market.

But an agreement is an agreement, and the industry is attempting to effect the changeover as painlessly as possible. Generally, the last buys of materials and parts for the old jobs have been made, and mills and partsmakers are figuring up their accumulative totals in order to adjust any shortages or overages. There may, of course, be some further purchases to balance inventories, but they will be small in the aggregate.

These last 1935 buys to not necessarily indicate an abrupt stoppage, since it is as long as 60 days between mill and assembly line for some parts. But in many plants a start is being made on parts for 1936 models, of which advance banks or inventories are required, while the assembly line still is dropping off 1935 cars at a good rate.

### Not Ready for Steel

Specifications for material and parts for their new series have been distributed by many automobile manufacturers, but in general, with the exception just noted, there have been comparatively few releases. Probably more hardware and interior trim is in process than any other class of material. It will be the middle or latter part of August before steel moves in volume to Detroit for 1936 cars.

August is supposed to be the low point of the season, to be the bottom of the curve of production on account of the earlier introduction of new models, but its snap and activity at the start exceed the best of 1932 and 1933 and are nothing that the peak month of 1934 could be ashamed of.

This month Olds and Pontiac are scheduled to go down, but the transitional period will be brief because comparatively few changes are expected to be made. It has been a hot race between these two General Motors favorites, the 1935 total for Olds to date being 125,000 and for Pontiac 128,000, and General Motors looks for 1936 to be even better for the price tier just above the bottom.

However, Olds and Pontiac will have a little stiffer competition within the General Motors family circle, as the revised Buick 40, which incidentally will use considerable stainless steel and chrome plating in its hood and louvers, is whispered as promising an unusual value. A start on this job is being made at Flint. Ternstedt is making the hardware, and Buick dealers generally are holding cleanup sales. It is possible that Buick, in a rising market, may come back strong. Buick's assembly lines were down last week.

So brisk did it find the retail market that Terraplane-Hudson made several buys of steel in July, and last week made what it expects was the cleanup of material requirements on the present series. However, no date has yet been set for new production, and it is not imminent. Terraplane-Hudson output last week was 1700 units.

At least one Hudson 1936 model will put streamline designers to shame, as it will blaze a new trail. Another lead that Hudson is considering taking for 1936 is in regard to trailers. This year built-in trunks or rear baggage compartments were enormously popular. But even these do not meet the requirements of an increasing number of automobile vagabonds.

### Good Market Is Visioned

A production-built trailer is a Hudson possibility. It may be a two-wheel affair, and styled to harmonize with its tow boat. At between $300 and $600 there is believed to be a fair market for this sort of equipment.

Graham has extended the bead around the rear of its small car, and has before it a design for a new radiator grille and hood for its larger lines. Graham has been turning out about 400 cars weekly.

Ford was to go down July 26 until Aug. 12 for the usual plant vacation. Most of the branches did close, but last-minute orders received at Detroit were sufficient to keep the Rouge plant operating several days last week, when the production total was 12,525. It is expected that op-

erations will be resumed at the Rouge Aug. 12 as scheduled.

Packard is planning to shut down from Aug. 9 to Aug. 26, but here again the strong retail demand may prevent the full holiday. Packard made almost $300,000 in the first half of 1935, against a loss of $2,900,000 in the first half of 1934. On the new 120 series it is understood to have gone from red to black in the past few weeks, although of course, not yet offsetting the millions—estimated up to ten—required to set up the new line.

**Many Changes in Plymouth**

Unusual secrecy is being maintained by Chrysler in regard to its forthcoming lines, but the talk revolves around a radical Plymouth. For the various Chrysler lines, last week's output was 8000 Plymouths, 5500 Dodges, 1100 Chryslers and 400 DeSotos. Much of its tool and die work has been placed in scattered out-of-town shops.

Chrysler, incidentally, has brought out new specifications for leaf springs. Thicknesses no longer conform to the Birmingham wire gage sizes but are based on a geometrical series of progressions in which the factor of progression itself increases by a geometrical series. A flat section replaces the previous concave one.

Speaking of dies, considerable Russian activity has been cropping out here the past ten days. Reports are conflicting, but there seems to be a basis for believing that three important Detroit shops—perhaps more—have participated in a Russian order for dies aggregating about $2,000,000.

It is said that these dies are for a model comparable to the 1934 Ford, and for a medium-price car closely resembling a Buick. Ford, it will be recalled, has co-operated with Autostroy, the soviet automobile monopoly, to the extent of loaning it technical advisers and admitting groups of soviet engineers to the Rouge plant.

**May Delay New Dies**

Incidentally, some domestic automobile manufacturers who have been a little late in getting a start on next year's dies may find this Russian work ahead of them and responsible for some delay.

Studebaker, which has been putting out about 1000 cars a week, is understood to be planning to push its eight strongly next year. For one thing, a radically-new radiator grille is in prospect. Many parts are being farmed out. Murray Body has the fenders.

Willys has received another reprieve, the courts sanctioning the assembling of a block of 10,000 cars. At the present rate of about 300 weekly, this means continued operations throughout most of the fall and winter.

Concerning a low-price car with minimum safety and operating features, to sell at about $350 to $400, with which at least three important manufacturers are experimenting, a highly-placed official of one makes this observation: There will be no market for such a car so long as used car lots are full of large cars available to $250 to $350. Americans are not interested in a small-size car or in a strip job—at least not until the glut of big, used cars is over.

## Automobile Production

Passenger Cars and Trucks—U. S. Only
By Department of Commerce

| | 1933 | 1934 | 1935 |
|---|---|---|---|
| Jan. | 128,825 | 155,666 | 292,817 |
| Feb. | 105,447 | 230,256 | 335,700 |
| Mar. | 115,272 | 338,434 | 429,834 |
| Apr. | 176,432 | 352,975 | 477,746 |
| May | 214,411 | 330,455 | 364,727 |
| June | 249,727 | 306,477 | 361,320 |
| July | 229,357 | 264,933 | *340,000 |
| 7 Mo. | 1,219,471 | 1,979,196 | *2,602,144 |
| Aug. | 232,855 | 234,811 | ..... |
| Sept. | 191,800 | 170,007 | ..... |
| Oct. | 134,683 | 131,991 | ..... |
| Nov. | 60,683 | 83,482 | ..... |
| Dec. | 80,565 | 153,624 | ..... |
| Year | 1,920,057 | 2,753,111 | ..... |

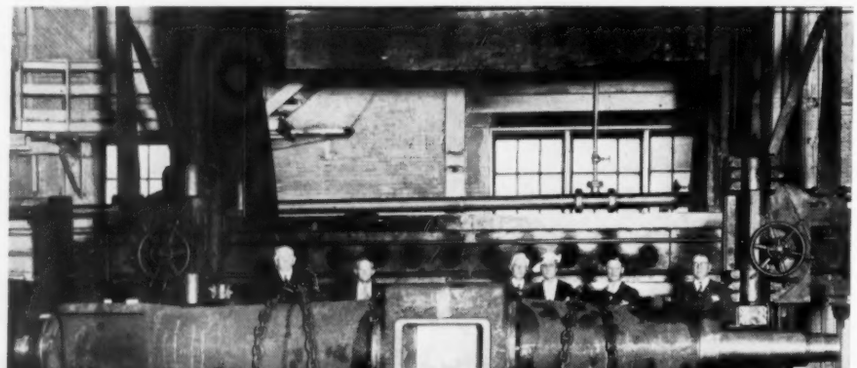
*Estimated.

Estimated by *Cram's Reports*

Week ended:

| | |
|---|---|
| July 27 | 82,894 |
| Aug. 6 | 69,415 |

## Accurate to 0.001 Inch in 24 Feet!



THIS is the machined and assembled polar axis of the 82-inch diameter reflecting telescope being built for the University of Texas by the Warner & Swasey Co., Cleveland. It consists of three cast steel sections weighing approximately 25,000 pounds. The center section is bored for two Timken roller bearings, 52 and 22⅝ inches in diameter. The forged steel shafts pressed into the ends have maximum diameters of 14 and 16 inches and the overall length of the polar axis is 24 feet 3 inches.

Extreme accuracy in machining was required, the roller bearing fits being held to one-third of 0.001 inch in roundness, and the allowable error in alignment of the roller bearings to the entire 24 feet of length is less than 0.001 inch. The axis was machined by the Wellman Engineering Co., of Cleveland. The three sections were machined separately and checked for alignment after assembly. Each piece was balanced before turning to eliminate errors due to unbalanced loads. Revolving mechanism with a worm wheel 9 feet in diameter and indicating wheels for setting are attached to the axis. The center section supports the 14-ton tube with 82-inch reflecting mirror, the weight of which made necessary massive construction to assure rigidity.

Left to right are E. P. Burrell, director of engineering for Warner & Swasey and designer of the observatory and telescope; H. J. L. Stark, chairman of the board of regents, University of Texas; George W. Burrell, president of Wellman; Mrs. I. D. Fairchild, chairman of the building committee, University of Texas; A. E. Gibson, vice president of Wellman; and Charles J. Stilwell, president of Warner & Swasey.

# WINDOWS OF WASHINGTON

*WASHINGTON*

THERE is a very general opinion among well-informed steel men in Washington that PWA will take no further action at this time on the protest of the American Iron and Steel institute against the 15 per cent price differential between domestic and foreign steel used in PWA projects.

Officials at PWA believe, it is reported, that inasmuch as the President practically expressed himself as feeling that the steel industry had no kick on this differential, it would be unwise on their part to make any further move — at least right now.

On the other hand, it is pointed out that in recent PWA instructions it was stated that if foreign steel could be obtained at 15 per cent less than domestic that it "must" be used.

Another statement has now been issued, it is said, in which it is said that foreign steel "may be used" in case it is 15 per cent less.

### Now Using Foreign Steel?

This changes the matter to a considerable extent and steel interests here seem to feel that the situation will be taken care of under the new interpretation.

Word has been received here that a great deal of foreign steel products, particularly piping, is being used on government projects, especially in the West, and this whole matter may be revived again.

Insofar as the procurement division of the treasury department is concerned, it is understood that at that branch of the government on bids up to $100 in value domestic manufacturers are given a 100 per cent differential, the same as is done at PWA, and that on amounts from $100 to $10,000 there is a differential in favor of domestic manufacturers of 25 per cent.

On amounts above $10,000 it is up to individual division heads to decide, but it is stated that domestic manufacturers are being taken care of.

Also, in all other government departments, while there is no special differential, it is generally understood that awards go, all other things considered, to domestic manufacturers.

In the administrative order about which there has been so much controversy at PWA it is stated that "regardless of the kind of material involved, if the cost of the domestic material covered by any one material contract or purchase order exceeds the cost of foreign made material of equal quality and quantity by any amount in excess of the approved differential, the foreign material *must* be purchased if the purchaser is a borrower, and *may* be purchased if the purchaser is a contractor."

However, this matter has been adjusted now, it is reported, because in the application blanks which must be signed it is there stated that purchases *may be* made from foreign firms and not *must be* as formerly.

Following the attack of Eugene G. Grace, president of the Institute, on the original PWA order, Charles R. Hook, president of the American Rolling Mill Co., Middletown, O., pointed out last week that average steel wages in the United States are 225 per cent higher than in foreign works, that in 1934 the receipt of 316,661 tons of foreign steel deprived American steel workers of 7,500,000 manhours, and that the PWA appropriation is predicated on making work for labor.

## BEGIN STEEL INDUSTRY STUDY; OUTLINE NOT YET MODIFIED

Actual work has commenced on the steel study being made by NRA under the direction of R. W. Shannon, formerly NRA administrator in charge of the steel code.

The policy on the field work on this survey has not yet been decided. There is a broad question at NRA whether each industry shall have its own field men, or whether field men will be appointed by NRA and then to be assigned to various studies.

Mr. Shannon has no idea at this time when the field work will be begun in connection with the steel survey.

The American Iron and Steel institute has not yet been asked to co-operate in this study by Mr. Shannon but it will later, in connection with the supplying of statistics of the industry, etc.

On the other hand, the Institute has been asked for its ideas on this study by another branch of NRA, which has nothing to do with this particular work.

### To Alter Radical Plans

Reference has been made in this column several times to the rather radical outline which was prepared for the steel study. It was stated by several high officials of the organization that this outline would be quite materially modified.

Up to this time it cannot be definitely learned whether or not this has been done.

There was so much feeling on this point at one time that a special conference was called to soften the outline, but the suggested conference never took place.

It is understood that some twenty persons are now employed on this survey, and from time to time advisers and consultants will be called in by Mr. Shannon and others working on the study.

It is doubtful if the work can be completed by the end of this year, which was the order of James L. O'Neill, who last week retired as acting director of NRA.

Some NRA officials consider that this study should be worked out something along the lines of the

work of the royal commissions of England, only NRA does not have the authority of the English commissions.

It is understood that Mr. Shannon is most anxious to avoid a one-sided presentation of any of the subjects taken up in this report and he wants to complete the records of the steel industry which are now in existence.

### NRA PERSONNEL FADING; FTC ABSORBS A FEW LAWYERS

The "big time" personnel of NRA is gradually being depleted. The latest industrialists to leave are Charles R. Edison and Howell Cheney, who have been looking after industrial interests since James L. O'Neill took over the job directing NRA. These two men will spend a day or two a week in Washington, and do what they can in that time.

There has been a great amount of talk about the way in which NRA will help the federal trade commission in its trade practice conference work. The wish has been father to the thought.

The trade commission has taken over a few NRA lawyers, just as other government organizations are absorbing a few of those being let out at NRA, but so far as any real help is concerned, that is another matter.

It has been suggested at the trade commission that certainly not more than 50 of the NRA personnel will be taken over and all of these will probably remain on the NRA payroll for the simple reason that the trade commission has no appropriation with which to hire additional help for trade practices or any other purpose.

It is reported at NRA that favorable reports are being received from various parts of the country from trade associations relative to the industrial studies to be undertaken by NRA. In most cases the associations are expressing a willingness to cooperate with the body in any study that is to be made.

In connection with the trade practice conferences of the trade commission, approximately 40 industries have filed applications with the commission asking for agreements, and these are now being considered. In addition, a large number of inquiries are being received as to procedure necessary to be followed in order to negotiate such agreements.

The commission has issued an official statement in explanation of its two groupings which may be incorporated in the agreements, and the commission in this connection states:

#### Explanation of Group I Rules

The unfair trade practices which are embraced in Group I rules are considered to be unfair methods of competition within the decisions of the federal trade commission and the courts, and appropriate proceedings in the public interest will be taken by the commission to prevent the use of such unlawful practices in or directly affecting interstate commerce.

#### Explanation of Group II Rules

The trade practices embraced in Group II rules do not, per se, constitute violations of law. They are considered by the industry either to be unethical, uneconomical or otherwise objectionable; or to be unconducive to sound business methods which the industry desires to encourage and promote. Such rules, when they conform to the above specifications and are not violative of law, will be received by the commission, but the observance of said rules must depend upon and be accomplished through the co-operation of the members of the industry concerned, exercised in accordance with existing law. Where, however, such practices are used in such manner as to become unfair methods of competition in commerce or a violation of any law over which the commission has jurisdiction, appropriate proceedings will be instituted by the commission as in the case of violation of Group I rules.

Incidentally, the first antitrust complaint since the voiding of NRA was filed last week by the trade commission. It involves toilet goods.

### JOBS MAY BE ONE BASIS FOR NRA INDUSTRIAL STUDIES

Industrialists and business men throughout the country are asking what is the real objective of the NRA surveys of various industries.

Officials at NRA say that it is to carry on studies of the various industries so that if congress later wants to legislate a permanent NRA or similar body that it will have all of the information at hand.

Another reason assigned by some experts at NRA is that certain industries have long wanted to make a survey of their own and they welcome this chance to have it made at government expense.

There is still another reason about which they do not talk so much—namely, keeping a group together which would be able to carry on in case any further NRA legislation is passed, because there are many in the organization who still believe this to be a possibility, perhaps not at this session of congress but at a subsequent one.

Also, there is always in the back of the minds of many of the executives that they have to keep as many deserving Democrats on the government payroll as possible.

### TO FIGHT PRESIDENT'S TAX PLAN IS TO PAL WITH RICH!

Unless the administration can tie a couple more stinging knots in its lash, any tax measure driven through the present session of congress will be far from the "soak the rich" and "spread the wealth" dose medicated by the President.

Congress' chief concern now is to prevent being jockeyed into a position where it will be labeled as defending the rich. Administration leaders who are lobbying for the tax program are trying to hang that position on their opponents. Either a congressman is for spreading the wealth in order to speed the more abundant life, or else he is a pal of the rich. The administration leaves no middle ground, and some of those growls emanating from Capitol Hill the past week were manifestations of resentment.

As introduced in the house last week, the tax measure would raise about $270,000,000 annually. This would spread wealth, among the nation's 120,000,000 people, at the rate of about $2.75 each. The present national debt is about $28,000,000,000, it will be close to $32,000,000,000 before the end of this fiscal year (next June 30), and the service on the debt is $900,000,000 annually.

Now, the federal corporation tax is a flat 13¾ per cent. It is proposed to make the tax 13¼ per cent on all net corporate income below $15,000 annually, and 14¼ per cent above. The law on corporation gifts was left untouched.

Most important, a levy on so-called excess profits of corporations is contemplated. On profits from 8 to 12 per cent the tax would be 5 per cent; from 12 to 16 per cent, 10 per cent; from 16 to 25 per cent, 15 per cent; and above 25 per cent, 20 per cent.

Harry E. Sheldon, president of the Allegheny Steel Co., Brackenridge, Pa., was scheduled to appear before the senate finance committee Friday on the tax matter, but was unable to appear.

## Transportation

THIRTY-FIVE replies to questionnaires mailed the iron and steel industry for the third quarter of 1935 by the Great Lakes regional advisory board indicate that there will be an increase in carloadings as compared with the same period of 1934.

Railroad reports for the third quarter of 1934 show 27,767 cars iron and steel actually loaded, and it is estimated 31,932 cars will be required during the same period of 1935, or an increase of 15 per cent.

### MESTA WINS SAFETY TROPHY

Employes of Mesta Machine Co., West Homestead, Pa., have been awarded the Pennsylvania Manufacturers' association trophy "for outstanding achievement in the advancement of safety during 1934." Award was made July 27 at the company's annual outing at Kennywood park, Pittsburgh, by John Flynn, president of the association. Lorenz Iversen, president of the Mesta company, accepted in behalf of the employes.

# Industrial Men in the Day's News

## Richard W. Johnson, Assistant Manager of Sales, Kalman Steel Corp.

He has been secretary of trade associations for the reinforcing steel and steel joist industries.

A graduate of West Point in 1922, he later served as engineer for number of interests.

During the life of NRA he held positions as secretary of code authorities in his industry.

RICHARD W. JOHNSON has been appointed assistant manager of sales of Kalman Steel Corp., subsidiary of Bethlehem Steel Corp.

Prior to assuming his new duties he was secretary of the Concrete Reinforcing Steel institute, Chicago, and secretary of the code authority, reinforcing materials fabrication industry. He was also secretary of the Steel Joist institute and of the Steel Joist institute code authority.

Subsequent to his graduation from the United States Military academy in 1922, he became assistant city engineer of Indianapolis. He served later as promotional engineer of the Portland Cement association, and in 1927 became affiliated with the Concrete Reinforcing Steel institute, as engineer.

Mr. Johnson will be attached to the general offices of Kalman Steel at Bethlehem, Pa. His appointment was effective Aug. 1.

♦ ♦ ♦

William S. Thomson has been appointed secretary of the Concrete Reinforcing Steel institute, Chicago, succeeding R. W. Johnson (see sketch above). Mr. Thomson was assistant secretary of the institute over the past two years, during which time the activities of the organization were confined to the administration of the code for the reinforcing materials fabricating industry. Previously he was chief engineer of the Corrugated Bar Co. and later of the Kalman Steel Corp.

♦ ♦ ♦

J. G. Carruthers, until recently vice president in charge of sales for Otis Steel Co., Cleveland, has been appointed special representative for the Bethlehem Steel Co., with headquarters at the general offices, Bethlehem, Pa. He first entered the steel industry as assistant manager of sales for Cambria Steel Co. at Cincinnati. Later he served as assistant manager, then manager of sales at Cincinnati for Carnegie Steel Co., Illinois Steel Co., and Tennessee Coal, Iron & Railroad Co. In 1922 he became associated with Otis at Cleveland as general manager of sales and member of the board of directors, later being advanced to the vice presidency.

♦ ♦ ♦

G. T. Christopher has been appointed vice president in charge of manufacturing of the Packard Motor Car Co., Detroit, succeeding E. F. Roberts, who has resigned after nearly 40 years' activity in the automobile industry.

♦ ♦ ♦

Arthur D. Heffron Jr., recently associated with the sales department of Globe Steel Tubes Co. at the main office in Milwaukee, was appointed manager of sales of the Cleveland district for this company, effective Aug. 1. His headquarters are in the Terminal Tower.

♦ ♦ ♦

Dr. Everett P. Partridge has been appointed director of research of Hall Laboratories Inc., Pittsburgh, effective Sept. 1. In this position he will be associated with Dr. Ralph E. Hall, managing director of Hall Laboratories and his staff, and with the scientific and technical specialists of Hagan Corp., the Buromin Co. and Calgon Inc., all of which are allied organizations. He will also work in co-operation with incumbents of the industrial fellowship sustained by Calgon at Mellon Institute of Industrial Research. Dr. Partridge has been active in research on boiler-water problems.

♦ ♦ ♦

William M. James has been appointed factory manager, and H. C. Rawlings production manager of the Lauson Co., New Holstein, Wis., the reorganization of the John Lauson Mfg. Co., of which Henry S. Wright has been elected president. The company is a pioneer foundry and machine shop.

♦ ♦ ♦

Wilfred Sykes, assistant to the president of the Inland Steel Co., Chicago, since 1930, has been elected a director to succeed the late E. M. Adams. He has been associated with the company since 1923, first in construction and engineering work, and later, starting in 1927, as assistant general superintendent of the Indiana Harbor works.

Wilfred Sykes

Born in New Zealand, he studied in Melbourne, Australia, and started his business career in that city, later spending two years in Germany. In 1909, he served as a steel mill engineer with the Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., and from 1920 to 1922 was executive engineer for the Steel & Tube Co. of America, Chicago.

♦ ♦ ♦

George L. Gaalaas has been ap-

pointed sales engineer in the electrical sheet department of Empire Sheet & Tin Plate Co., Mansfield, O. For the past nine years he has been design engineer, sales engineer and manager of synchronous motor division for the Ideal Electric Mfg. Co., Dayton, O.

♦ ♦ ♦

C. S. DeLong has been elected a director of the Oliver Farm Equipment Co., Chicago, succeeding the late John Nichols.

♦ ♦ ♦

H. C. Scholfield, Toronto, Ont., has been elected president of Page-Hersey Tubes Ltd., succeeding the late W. W. Near.

♦ ♦ ♦

R. B. Nuckols has been appointed assistant sales manager of the Standard Tool Co., Cleveland. He has been located in southwestern territory with headquarters in St. Louis since 1919.

♦ ♦ ♦

W. Bruce Caldwell has been named works manager of the Calumet Steel Co., recently acquired subsidiary of Borg-Warner Corp., Chicago Heights, Ill. He has been associated with the steel industry since his graduation from the school of mechanical engineering of Cornell university in 1912. Later he was connected with the National Malleable & Steel Castings Co., at Sharon, Pa. After serving in the aviation division of the navy during the war, he was associated with Sharon Steel Hoop Co., Sharon, from 1919 until 1933, serving as general superintendent of all plants of that company.

W. Bruce Caldwell

## Head District Steel Tube Sales Office

W. S. Carson

R. C. Garvey

W. S. Carson has been appointed district sales manager at Cleveland for the Detroit Seamless Steel Tubes Co., Detroit, with headquarters at 2110 Terminal Tower.

R. C. Garvey, his associate for the past ten years, has been named assistant district sales manager. Both men are widely known in the seamless tube industry, former associations including Standard Seamless Tube Co., Pittsburgh, Bourne-Fuller Co., Cleveland, Joseph T. Ryerson & Son Inc., Cleveland, and more recently the Globe Steel Tubes Co., Milwaukee.

# Died:

CHARLES B. THORNE, 45, research engineer for Arthur G. McKee & Co., Cleveland, at the plant of Republic Steel Corp., Buffalo, from accidental electrocution, Aug. 1. An unusually capable engineer, he had been with the McKee organization for about 10 years. He was inspecting an electrical precipitator from which high-potential current had been shut off, when, clothing wet, he accidentally came in contact with a 220-volt electric light extension wire.

♦ ♦ ♦

David Rosenfield, an official in the Standard Tank Car Co. plant, Sharon, Pa., in that city, recently.

♦ ♦ ♦

Harold D. Carson, 50, mill official with John A. Roebling's Sons Co., Trenton, N. J., in Point Pleasant, N. J., July 29.

♦ ♦ ♦

Grant Sipp, 68, president of the Sipp-Eastwood Corp., Paterson, N. J., manufacturer of textile machinery, in Torrington, Conn., July 28.

♦ ♦ ♦

Alvin S. Berger, 37, a salesman for the Thomas & Skinner Steel Products Co., Indianapolis, in Paulding, O., as a result of an automobile accident.

♦ ♦ ♦

William Gates, secretary of H. C. Frick Coke Co., Pittsburgh, in that city, July 30. Born in Kittanning, Pa., he had spent practically all of his business career with the Frick company.

♦ ♦ ♦

James L. Junkin, 62, associated with the safety division of the industrial relations department of Weirton Steel Co., in Steubenville, O., July 27. Formerly with Wheeling Steel Corp., he had been with Weirton since 1925.

♦ ♦ ♦

Leonard W. Whitmore, 66, president of the Whitmore Machine & Foundry Co., and treasurer of the International Wire Works, Menasha, Wis., July 29. He was widely known in the paper mill machinery industry.

♦ ♦ ♦

Willard S. Beck, 53, assistant comptroller, United States Pipe & Foundry Co., Burlington, N. J., in Delaware City, Del., July 28. He had been in the employ of the company for 30 years, starting as a clerk.

♦ ♦ ♦

Gustav Lindenthal, 85, prominent pioneer bridge designer and builder, in Metuchen, N. J., July 31. Among bridges he designed is the famous Hell Gate span, New York. He came to the United States from Austria in 1874 and his first association was with the Keystone Bridge Co.

# Production

STEELMAKING operations pushed up 2 points last week to 47 per cent, making a gain of 16 points over the July 4 holiday low. This rise was due to heavier schedules in the Chicago, Youngstown, eastern Pennsylvania, Wheeling and Cleveland districts. A year ago the steel rate was only 26½ per cent. Details for districts follow:

**Cleveland-Lorain** — Up 6 points to 54 per cent, Corrigan, McKinney Steel Co. lighting two more open hearths to operate nine; Otis Steel Co. continuing with four, and National Tube Co., Lorain, with eight. A further increase is expected this week as in at least one instance sheet and strip production has been running ahead of ingot output.

**New England** — Off seven points to 25 per cent of capacity last week. A substantial rebound is expected this week with at least two idle open hearths going into production.

**Central eastern seaboard**—An advance of 2½ points is recorded in steelmaking operations, to 31 to 32 per cent. This increase appears to reflect more largely specifications coming in from outside the immediate district. An improvement is noted in tin plate and wire products, and a better plate tonnage is recorded. One eastern plate mill advanced recently the number of open hearths in operation from five to six, to a point as high as any this year. Finishing operations also are expanding at some plants, with the Pencoyd, Pa., producer, expecting to put on its large mill this week.

**Wheeling, W. Va.** — Up three points to 76 per cent through last week, 28 out of 37 open-hearth furnaces being on active schedule, one more than a week ago.

**Pittsburgh** — Unchanged at 41 per cent through last week, marking the first leveling off since advances in local steelmaking operations got under way after July 4. Although several independent steelmakers continue to report advancing operations, the depressed rate of the leading interest locally holds down the district's average.

Twenty-one steelworks blast furnaces remain on here.

**Chicago** — Scored gains in both blast furnace and open-hearth operations. Steelmaking was at 52 per cent by the end of the week, a gain of 3 points and the highest rate in nearly three months. Two mills each added one blast furnace, giving the district 13 active steelworks stacks out of 36. Two merchant units also are in blast. Sustained steelmaking operations are in prospect for the coming several weeks at least.

**Youngstown, O.**—Averaged 53 per cent last week, an increase of 4 points. The tentative schedule for the beginning of this week is 51 per cent. Considering that business flows in unevenly, especially from the automotive industry, this variation is not regarded apprehensively.

**Buffalo**—Unchanged at 37 per cent, as Bethlehem continues with nine open hearths on, Republic four and Wickwire Spencer one. Seneca sheet division of Bethlehem is operating at 50 per cent.

## Steelmaking Operations

Percentage of Open-Hearth Ingot Capacity Engaged in 10 Leading Districts

| | Week ended Aug. 3 | Change | Same week 1934 | Same week 1933 |
|---|---|---|---|---|
| Pittsburgh .... | 41 | None | 19 | 48 |
| Chicago ..... | 52 | + 3 | 32 | 54 |
| Eastern Pa..... | 31½ | + 2½ | 22 | 43½ |
| Youngstown... | 53 | + 4 | 35 | 65½ |
| Wheeling ..... | 76 | + 3 | 25 | 80 |
| Cleveland ..... | 54 | + 6 | 32 | 79 |
| Buffalo ..... | 37 | None | 32 | 57 |
| Birmingham... | 31½ | None | 0 | 55 |
| New England | 25 | — 7 | 38 | 76 |
| Detroit ..... | 94 | None | 76 | 55 |
| Average ..... | 47 | + 2 | 26½ | 54 |

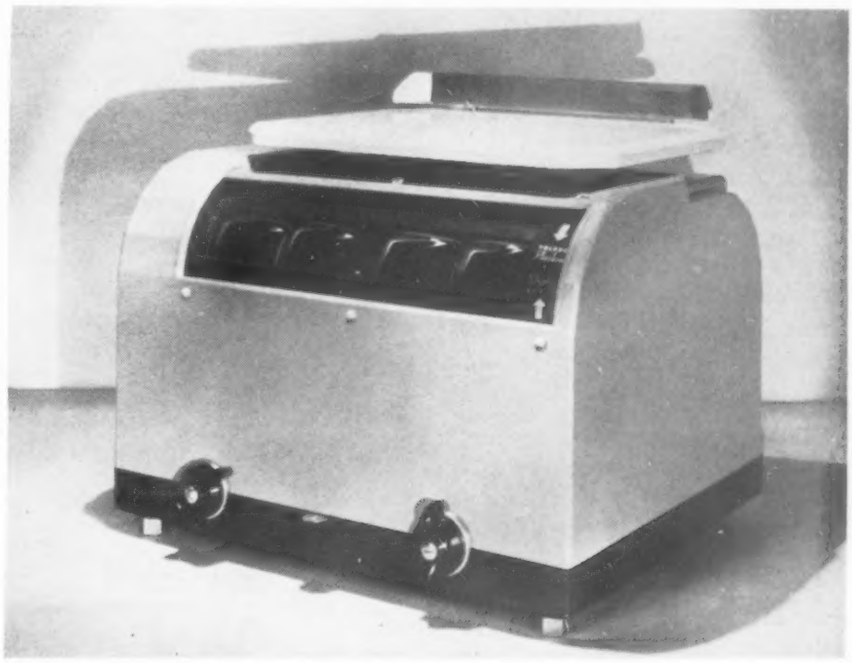
# Redesigned Scale, with Molded Plastic Housing, Is Tribute to Research

INTERESTING example of the results of co-operative research in the development of a new product was revealed last week with the announcement of the new Plaskon scale for retail stores. The scale, a product of the Toledo Scale Co., Toledo, O., is distinctive in that it involves a complete departure from traditional design, as well as the use of a molded plastic housing, reported to be the largest single molded plastic part ever produced.

Bausch & Lomb Optical Co., General Electric Co., Aluminum Co. of America and Mellon Institute of Industrial Research co-operated with the Toledo company in developing new features of the scale, work on which started in 1928.

Weight has been reduced from 154 pounds in older models to 55 pounds in the new, partly resulting from use of the plastic housing. Production of the latter part required a 1500-ton press, with nine hydraulic rams and 22 feet in height. This equipment was built by French Oil Mill Machinery Co., Piqua, O. and installed in the General Electric plant at Fort Wayne, Ind.

Die for the molded housing was cut from a solid block of steel weighing 7 tons. Molding material—Plaskon—is the urea formaldehyde plastic produced by Toledo Synthetic Products Inc. Color of the first scales produced is white, although other light colors are possible. Cylindrical chart of the scale is of sheet aluminum alloy, 0.005-inch thick, with figures lithographed on the metal.



# June Steel Imports In Sharp Decline

IMPORT trade in steel and iron products in June, totaling 32,208 gross tons, was 30.4 per cent lower than the 47,719 tons imported in May, according to figures of the metals and minerals division of the department of commerce. Sharp as was this decline, imports were about 33 per cent higher than in June, 1934.

The heaviest decline from May to June was in pig iron, which dropped 16,591 tons, about 72 per cent, from May. This was sufficient to have turned the import trend downward. Wire rods declined 1028 tons and bars 707 tons. Increased tonnage was imported in scrap, 1594 tons, shapes, 708 tons, and sheets, skelp and saw plate, 664 tons.

In spite of the decline in pig iron imports this was the largest tonnage item in June. Of the 6583 tons brought in British India contributed 2952 tons, the Netherlands 1364 tons, United Kingdom 1050 tons, the Soviet Union 490 tons and Canada 368 tons.

Structural shapes were second in size, with 4394 tons and ferromanganese and spiegeleisen third with 4153 tons, of which Norway sent 1565 tons and Canada 1374 tons. Germany sent 8592 tons in June, Belgium second with 7010 tons, Canada 4413 tons.

Exports in June, at 289,687 tons showed an increase of 3089 tons over the May total of 286,598 tons. However June exports were 32 per cent greater than those of June, 1934, when the total was 219,406 tons.

Complete export statistics will be available next week.

**FOREIGN TRADE OF UNITED STATES IN IRON AND STEEL**

Gross Tons

| | 1935 | | 1934 | |
|---|---|---|---|---|
| | Imports | Exports | Imports | Exports |
| Jan. | 22,784 | 262,740 | 22,653 | 178,023 |
| Feb. | 28,905 | 228,537 | 25,407 | 151,184 |
| Mar. | 21,409 | 323,035 | 38,393 | 261,269 |
| April | 28,866 | 205,336 | 26,862 | 201,539 |
| May | 47,719 | 286,598 | 29,465 | 241,753 |
| June | 33,208 | 289,687 | 24,848 | 219,406 |
| 6 mo. | 182,891 | 1,595,933 | 167,605 | 1,253,174 |
| July | ..... | ..... | 17,676 | 233,186 |
| Aug. | ..... | ..... | 32,418 | 242,947 |
| Sept. | ..... | ..... | 23,847 | 301,330 |
| Oct. | ..... | ..... | 20,202 | 220,209 |
| Nov. | ..... | ..... | 35,272 | 299,263 |
| Dec. | ..... | ..... | 19,708 | 282,655 |
| Total | ..... | ..... | 316,761 | 2,832,764 |

**ORIGIN OF JUNE IMPORTS**

Gross Tons

| | Pig iron | Manganese ore | Ferromanganese |
|---|---|---|---|
| Germany | 100 | ..... | 630 |
| France | ..... | 7 | 352 |
| Netherlands | 1,364 | ..... | ..... |
| Chile | ..... | 26 | ..... |
| Norway | 152 | ..... | 1,565 |
| Gold Coast | ..... | 1,311 | ..... |
| Sweden | 107 | ..... | ..... |
| Italy | ..... | ..... | 33 |
| United Kingdom | 1,050 | 3 | 199 |
| Canada | 368 | ..... | 1,374 |
| British India | 2,952 | 701 | ..... |
| Soviet Russia | 490 | 9,186 | ..... |
| Total | 6,583 | 11 235 | 4,153 |

| | Sheets, skelp and sawplate | Structural steel | Steel bars | Hoops and bands |
|---|---|---|---|---|
| United Kingdom | 31 | ..... | 18 | 225 |
| Belgium | 635 | 2,615 | ..... | 1 826 |
| Germany | 599 | 73 | 8 | 322 |
| Sweden | 21 | ..... | 350 | ..... |
| France | ..... | 506 | ..... | 125 |
| Venezuela | ..... | 1,200 | ..... | ..... |
| Austria | ..... | ..... | 6 | ..... |
| Czechoslovakia | ..... | ..... | 2 | ..... |
| Norway | ..... | ..... | 2 | ..... |
| Netherlands | ..... | ..... | ..... | 6 |
| Canada | ..... | ..... | ..... | 3 |
| Total | 1,286 | 4,394 | 386 | 2,517 |

**UNITED STATES IMPORTS OF IRON AND STEEL PRODUCTS**

Gross Tons

| Articles | June, 1935 | May, 1935 | Jan. thru June,'35 |
|---|---|---|---|
| Pig iron | 6,583 | 23,174 | 53,486 |
| Sponge iron | 204 | 50 | 666 |
| Ferromanganese and spiegeleisen (1) | 4,153 | 4,633 | 22,528 |
| Ferrochrome (2) | ..... | ..... | 1 |
| Ferrosilicon (3) | 52 | 25 | 518 |
| Other ferroalloys (4) | ..... | ..... | 1 |
| Scrap | 2,417 | 823 | 12,056 |
| Steel ingots, blooms, etc. | 28 | 34 | 1,032 |
| Concrete bars | 300 | 190 | 808 |
| Hollow bar, drill steel | 66 | 92 | 471 |
| Merchant steel bars | 324 | 843 | 7,830 |
| Bars solid, hollow (6) | 1,187 | 1,894 | 2,081 |
| Iron slabs | ..... | ..... | ..... |
| Iron bars | 317 | 48 | 634 |
| Wire rods | 722 | 1,750 | 7,174 |
| Boiler and other plate | 94 | ..... | 167 |
| Sheets, skelp, saw plate | 1,286 | 622 | 3,982 |
| Tin plate | 1 | 17 | 101 |
| Structural shapes | 4,394 | 3,686 | 17,481 |
| Sheet piling | ..... | ..... | ..... |
| Rails and fastenings | 185 | 379 | 1,644 |
| Cast iron pipe, fittings | 27 | ..... | 27 |
| Malleable iron pipe fittings, advanced | ..... | ..... | 46 |
| Welded pipe | 361 | 175 | 915 |
| Other pipe | 3,174 | 1,337 | 8,116 |
| Cotton ties (5) | ..... | 1,474 | 1,743 |
| Other hoops and bands | 2,517 | 2,276 | 11,074 |
| Barbed wire | 2,344 | 1,900 | 13,322 |
| Round iron, steel wire | 488 | 388 | 2,184 |
| Telegraph telephone wire | 4 | 6 | 17 |
| Flat wire, strip steel | 97 | 134 | 803 |
| Wire rope and strand | 123 | 98 | 920 |
| Other wire | 40 | 57 | 437 |
| Nails, tacks, staples | 1,542 | 1,441 | 8,492 |
| Bolts, nuts, rivets | 56 | 37 | 198 |
| Horse and mule shoes | 28 | 61 | 346 |
| Castings and forgings | 94 | 75 | 590 |
| Total gross tons | 33,208 | 47,719 | 182,891 |

(1) Manganese content.
(2) Chrome content.
(3) Silicon content.
(4) Alloy content.
(5) New class, no comparable figures for 1934 or previous years.
(6) New classification as result of the Reciprocal Trade Agreement with Belgium. No comparable figures for previous month or year.

## Par-Brook Mfg. Co. Takes Riester & Thesmacher Plant

As a result of a reorganization recently completed Par-Brook Mfg. Co., Cleveland, has acquired the plant, property, assets and business of Riester & Thesmacher Co., from Riester & Thesmacher Co. bond holders' protective committee.

Par-Brook Mfg. Co. has been successful in procuring an industrial loan participated in by the reconstruction finance corporation and by the Cleveland Trust Co. and is issuing preferred stock for distribution to holders of the bonds of the Riester & Thesmacher Co. who deposited their bonds with the protective committee. The reorganization plan further contemplates issuance of common stock to holders of such preferred stock in accordance with the provisions of the plan.

The board of directors of the Par-Brook Mfg. Co. consists of Albert M. Baehr, Carl R. Edson, George F. Collister, John R. Cary and R. L. Alexander, all of Cleveland. Mr. Baehr is president, Mr. Edson treasurer, and Mr. Collister secretary.

The company is operating under the general management of Mr. Collister, a well-known manufacturing executive, supported by William H. Snyder, factory manager; C. Motts, superintendent; and Harry Feick, sales, all of whom, as well as the engineering force, were retained from the old organization because of their ability and years of experience.

Par-Brook Mfg. Co. has one of the largest plants in the country devoted exclusively to fabrication of sheet metal products. Work in process includes cabinets, cases, advertising signs, constructed of lighter gages of metal finished in lacquer or enamel, hollow metal doors, door frames, metal stairs and parts constructed of light plate for industrial use.

# Meetings

AMERICAN INSTITUTE OF STEEL CONSTRUCTION, 200 Madison avenue, New York, has called its annual convention at White Sulphur Springs, W. Va., for Oct. 16-18.

**SEPT. 20 RAILROAD DAY AT MACHINE TOOL SHOW**

Friday, Sept. 20, has been designated Railroad Day at the machine tool show being held by the National Machine Tool Builders' association in the Cleveland public auditorium, Sept. 11-21. This is because the railroad industry probably constitutes the greatest potential market for machine tools, according to the association.

**CHICAGO B.F.C.A. TO GOLF**

Blast Furnace and Coke Association of the Chicago District will hold its ninth annual golf tournament at the Olympia Fields Country club, Aug. 8. Golf will be played both in the morning and afternoon, with dinner at 6:30 p.m. H. W. Johnson, Inland Steel Co., Indiana Harbor, Ind., is secretary.

# EDITORIAL

## Consistency, Thou Art Not a Jewel in New Deal!

THE most consistent thing about the new deal is the unvarying degree of inconsistency with which its policies are developed and administered. Promises are forgotten or broken so casually, principles are sacrificed for political expediency so frequently and both ends are played against the middle so brazenly that the word of a new deal spokesman now is usually accepted at a heavy discount.

A fine example of consistent inconsistency is found in the new deal attitude on the purchase of materials under the work relief appropriation of $4,800,000,000. Under a PWA order dated May 25, contractors engaged in public work must buy steel and other materials abroad when a saving of 15 per cent or more can be effected, with satisfactory delivery. This order is inconsistent and in conflict with an order issued June 20, 1934, by the chief government procurement agent, which provides for a differential of 25 per cent.

In protesting against the application of the PWA order, representatives of the steel industry argued that purchase of foreign steel would tend to affect employment in the American steel industry adversely. Inasmuch as the $4,800,000,000 was appropriated for relief, it would seem that the protest is well founded.

### President Ignores Employment Factor But Introduces Tariff Issue Into Controversy

Nevertheless, in defending the 15 per cent ruling, President Roosevelt in his press conference Friday neglected to say anything about the employment or relief implications of the differential. He talked only of the "protection" features of the ruling, and thus introduced the tariff issue into the controversy.

The President is reported to have said that the steel industry is protected by a "high" or a "fairly high" tariff. Also he observed that this "high" or "fairly high" protective wall was erected by a previous administration. The inference is that the President does not want to be put in the position of defending this "high" or "fairly high" tariff. At any rate, he gave the impression to the public that the steel industry enjoys a large measure of protection.

The fact is that the present duties on iron and steel are low compared to the duties provided in every tariff law enacted since 1883, with the single exception of those under the Underwood act of 1913 which was made largely inoperative by the World war. Here is a comparison of duties for typical products:

| Act of | 1883 | 1890 | 1894 | 1897 | 1909 | 1913 | 1922 | 1930 |
|---|---|---|---|---|---|---|---|---|
| Iron ore* | $0.75 | $0.75 | $0.40 | $0.40 | $0.15 | Free | Free | Free |
| Pig iron* | 6.72 | 6.72 | 4.00 | 4.00 | 2.50 | Free | .75‡ | 1.125 |
| Rails* | 20.16 | 13.44 | 7.84 | 7.84 | 3.92 | Free | 2.24 | 2.24 |
| Shapes† | 25.00 | 18.00 | 12.00 | 10.00 | 8.00 | 10% | 4.00 | 4.00 |
| Tin plate§ | 1.00 | 2.20 | 1.20 | 1.50 | 1.20 | 15% | 1.00 | 1.00 |

*Per long ton. †Per net ton. §Per 100 pounds.
‡Duty on pig iron was increased to $1.125 in 1927 under the flexible provisions of the 1922 act.

It is seen that the Hawley-Smoot bill of 1930 did not change the tariff on steel appreciably. As James A. Farrell remarked at the meeting of the American Iron and Steel institute in May, 1930, "the steel industry asked for nothing and it got nothing." In brief, iron and steel duties are not "high" nor "fairly high" in comparison with the levels of past tariff history.

### Pegged High Wages and Short Day Cannot Be Reconciled with Revenue Tariff Policy

If President Roosevelt is harboring ideas in reference to changes in the tariff, he will do well to recall his campaign statements on the subject. Before his election, he came out in favor of a competitive tariff—

> "one which will put American producers on a market equality with their foreign competitors, one that equalizes the difference in cost of production, not a prohibitory tariff back of which domestic producers may combine to practice extortion of the American public. . . . I appreciate that this doctrine is not widely different from that preached by Republican statesmen and politicians."

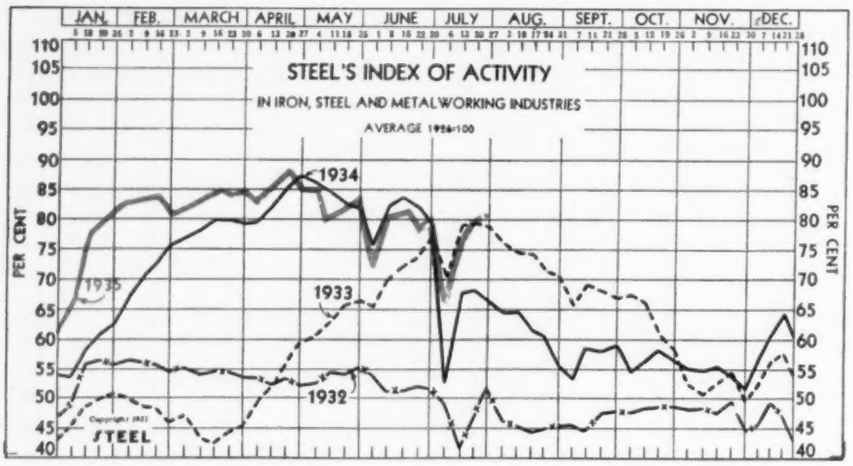
This, even in 1935, would make a good tariff platform!

But there is still another inconsistency. The new deal in 1933 and 1934 shouted from the housetops that one of its objectives was to lift prices to 1926 levels. Through NRA, AAA and dozens of other agencies it has succeeded in raising the cost of production considerably. More than that, it has pegged certain important costs at artificial levels. The prevailing wage levels, in steel and some other industries are above the peak of 1929. The short week is in effect and there are numerous restrictions, most of them introduced by the new deal, which impose high fixed charges upon industrial operations.

Obviously American manufacturers cannot maintain these artificial standards without sacrificing the traditional weapons of defense against foreign competition. The inconsistencies are so great that we can't have both at the same time.

The easiest way for the new deal to work itself out of this mess is to concentrate on recovery at home.

# THE BUSINESS TREND




STEEL'S *index of activity in the iron, steel and metalworking industries gained* 1.0 *points to* 80.8 *in the week ending July* 27:

| Week ending | 1935 | 1934 | 1933 | 1932 |
|---|---|---|---|---|
| May 25 | 82.8 | 81.9 | 66.1 | 54.2 |
| June 1 | 71.9 | 75.7 | 65.3 | 51.0 |
| June 8 | 79.3 | 82.3 | 69.9 | 51.1 |
| June 15 | 80.0 | 83.6 | 72.1 | 51.8 |
| June 22 | 77.3 | 81.8 | 73.9 | 51.6 |
| June 29 | 78.4 | 79.4 | 77.0 | 49.2 |
| July 6 | 64.1 | 52.3 | 71.4 | 41.7 |
| July 13 | 76.5 | 67.8 | 79.1 | 46.7 |
| July 20 | 79.8† | 68.1 | 79.4 | 51.5 |
| July 27 | 80.8* | 66.4 | 78.8 | 46.1 |

†Revised. *Preliminary.

*The index charted above is based upon freight car loadings, electric power output, automobile assemblies (estimated by Cram's Reports) and the steelworks operating rate (estimated by* STEEL). *Average for* 1926 *equals* 100, *weighted as follows: Steel rate* 40, *and car loadings, power output and auto assemblies each* 20.

## Nearby Outlook Is Favorable; Long Term View Is Clouded

INDUSTRIAL activity still is expanding moderately. STEEL'S index for the week ending July 27 stood at 80.8, which is the highest point recorded since the last week of May.

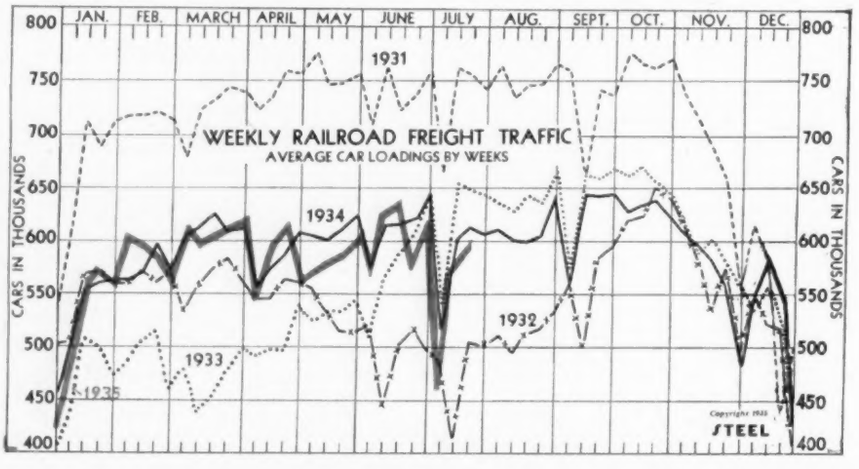
The marked ascendancy of the trend of activity at a time of the year when ordinarily business is dull has lifted the index to an unusually high point for July. The 80.8 for the last full calender week of July tops the index for the corresponding week of every year back to and including 1930. However, it falls far short of the index for the final July week of 1929, which was 120.8.

Contributing to the gain for the week ending July 27 was a further increase in steelworks operations and a spectacular, off-season rise in electric power output. The weekly total of 1,823,521,000 kilowatt-hours has been exceeded only five times—in the weeks ending Oct. 26, Dec. 14 and Dec. 21, 1929, and Jan. 18 and 25, 1930. Revenue freight car loadings were expected to show a slight gain. Automobile assemblies dropped several hundred units from the previous week.

As a result of the gratifying gains in July, business sentiment is more buoyant than at any time since the short-lived spurt in the spring of 1933. Nevertheless, optimism over the immediate prospect is tempered by the realization that the government has bungled the relief situation and that there still are no signs of a real effort to curb federal expenses. Another sobering factor is the continuing threat of further financial difficulties in Europe.

In brief, the short-term outlook is favorable; the long-term prospect is clouded by political uncertainties and international complications.

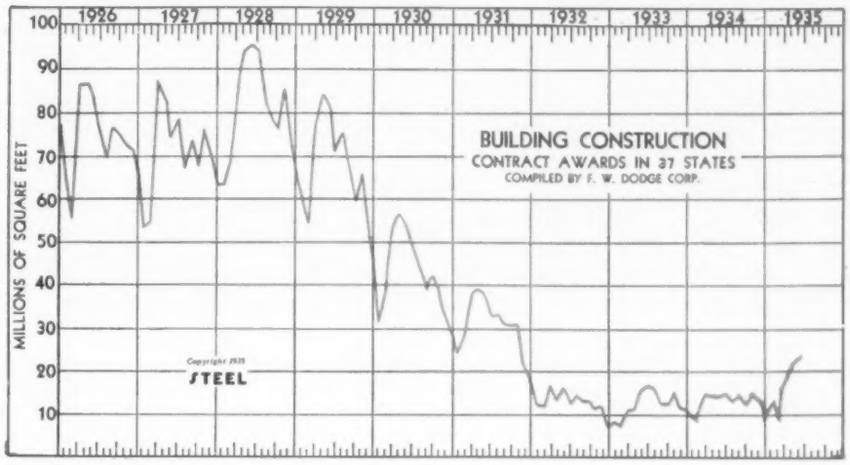
| 1935 | |
|---|---|
| July 20 | 593,366 |
| July 13 | 566,488 |
| July 6 | 472,421 |
| June 29 | 618,036 |
| June 22 | 567,847 |
| June 15 | 653,092 |
| June 8 | 630,836 |
| June 1 | 565,342 |
| May 25 | 599,543 |
| May 18 | 583,327 |
| May 11 | 575,185 |
| May 4 | 569,065 |




| 1934 | |
|---|---|
| July 21 | 616,040 |
| July 14 | 602,778 |
| July 7 | 520,741 |
| June 30 | 646,003 |
| June 23 | 623,322 |
| June 16 | 618,881 |
| June 9 | 616,768 |
| June 2 | 579,656 |
| May 26 | 625,990 |
| May 19 | 612,331 |
| May 12 | 602,798 |
| May 5 | 605,246 |

## June Building Construction Shows Slight Gain

| | Square Feet | |
|---|---|---|
| | 1935 | 1934 |
| January | 11,245,100 | 9,568,700 |
| February | 9,670,300 | 8,176,300 |
| March | 15,873,100 | 14,788,900 |
| April | 19,981,100 | 14,207,100 |
| May | 22,276,200 | 14,664,400 |
| June | 22,878,800 | 13,986,500 |
| July | | 13,250,000 |
| August | | 14,259,000 |
| September | | 12,510,300 |
| October | | 15,098,100 |
| November | | 12,780,800 |
| December | | 9,193,300 |

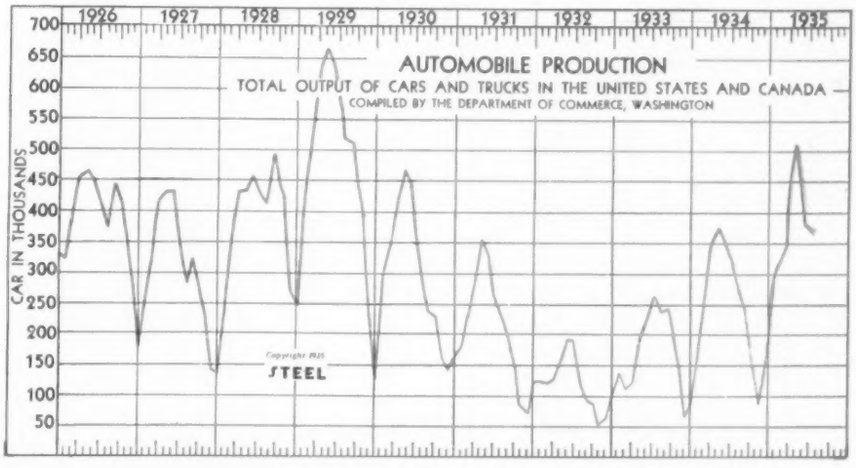


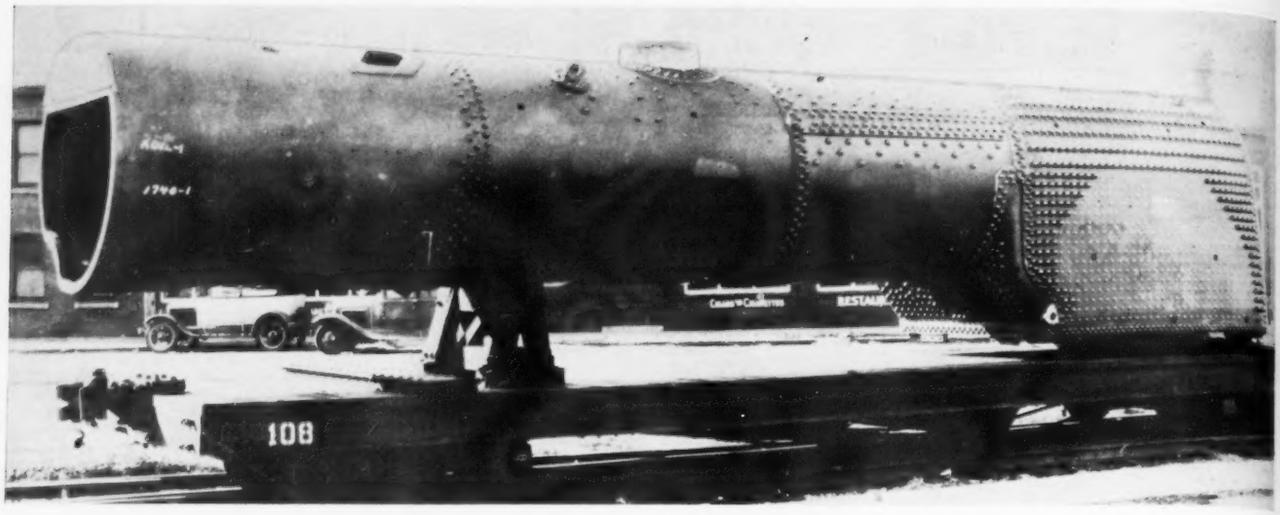

## Industrial Production Points Upward in June

| | 1935 | 1934 | 1933 |
|---|---|---|---|
| January | 91 | 78 | 65 |
| February | 89 | 81 | 64 |
| March | 88 | 84 | 60 |
| April | 86 | 85 | 67 |
| May | 85 | 86 | 77 |
| June | 86 | 84 | 91 |
| July | .... | 75 | 100 |
| August | .... | 73 | 91 |
| September | .... | 71 | 84 |
| October | .... | 73 | 77 |
| November | .... | 74 | 73 |
| December | .... | 86 | 75 |

## Automobile Output Continues Seasonal Decline

| | 1935 | 1934 |
|---|---|---|
| January | 303,372 | 162,570 |
| February | 358,658 | 238,827 |
| March | 451,809 | 352,614 |
| April | 501,837 | 371,338 |
| May | 385,486 | 350,616 |
| June | 377,065 | 320,382 |
| July | .... | 276,047 |
| August | .... | 244,715 |
| September | .... | 175,586 |
| October | .... | 135,771 |
| November | .... | 85,179 |
| December | .... | 156,356 |






*Boiler and firebox of silico-manganese steel for one of the streamlined locomotives built by American Locomotive Co. to haul the twin Hiawathas, high-speed trains of the Chicago, Milwaukee, St. Paul & Pacific. The boiler will operate at 300 pounds pressure; the steel was furnished by the Lukens Steel Co.*

# Developing Alloy Steels for High-Pressure Boilers and Pressure Vessels

BY L. P. McALLISTER
Lukens Steel Co.

IMAGINE admitting 10 to 15 years ago that boiler plate with tensile strength of 75,000 pounds per square inch was fit for fabrication. Common opinion readily would have labeled such steel as hard; yet to day agreement is almost unanimous that the 55,000-pound minimum tensile strength steel, equal to specification S-1 of the American Society of Mechanical Engineers' boiler code, is losing its popularity, particularly in heavy-walled shells.

Designers have turned from butt-strapped joints to fusion welded seams, and with welding came restrictions on material which the process of riveting did not demand. Fabricators realized and welding experimenters discovered that in large sections or heavy plates some lack of uniformity in chemical composition presented problems in obtaining ductile welds. Therefore, with introduction of the metallic arc, steel manufacturers found themselves confronted with a demand for more uniform steel to permit acceptable welded joints.

### Maintaining Carbon Uniform

With the demand for a more uniform base metal naturally came extensive experimentation and development in welding technique and procedure. Next, the carbon content in the boiler and firebox grades of steel was limited to 0.35 per cent maximum. This restriction, although seemingly a natural one from the fabricating group, made it practically necessary that heavy plates be no longer produced of open or rimming steel, and required a killed or deoxidized steel by which process the carbon content could be maintained more uniformly from end to end of large plates, thereby offering the welder more homogeneous and uniform edges for his seams.

Demands for higher pressures brought the necessity of thicker shells, and to meet or overcome some restrictions of fabrication the boiler code adopted two new higher tensile steels, namely, specification S-26 and specification S-27, respectively calling for 70,000 pounds per square inch minimum tensile strength for plate material up to and including 2 inches thick, and over 2 inches up to and including 4 inches. Here was a decided forward step, recognizing the advisability of higher strength material balanced by good ductility and workability. Many tons of these plates have been rolled, and to match them numerous heads have been flanged of this so-called high tensile grade steel. Success to date has been rewarded by an increasing demand for this 70,000 pounds per square inch minimum material.

### Turn to Alloying Elements

The next step in developing plate material presents a new angle. Welding technicians advise against higher carbon, so to meet the still pressing request for high strength, alloying elements have to be added to the plain carbon analyses. Through long usage, the properties of plain carbon steel have become fairly well known as have the economic limitations of this steel. Now, with the advent of additional and sometimes singular properties inherited from contained alloy, boiler and pressure vessel plate and head material presents a new economic aspect for consideration.

When planning alloys for plate material, the first incentive is to produce higher strength without un-

*THE accompanying article constitutes a paper presented before the annual meeting of the National Board of Boiler and Pressure Vessel Inspectors in Chicago, May 16. The author, L. P. McAllister, is assistant metallurgical engineer, Lukens Steel Co., Coatesville, Pa.*

proportional loss of ductility. High strength in sufficient increments naturally permits a decided decrease in wall thickness and weight, and thereby presents for comparison a saving in purchased weight. The use of alloy steel may be more economically justified perhaps when due consideration is given to such factors as decreased purchased weight, reduced transportation costs on this lighter weight material both in the unfabricated and the fabricated state, possible lower shop costs due to the welding of thinner shell sections, and the metallurgical advantages derived from contained elements. Prevailing fabricating methods and welding technique must be given due regard in new steels. Little if any advantage would result from superior quality alloys if fabrication and welding could not be carried out with success.

### Must Prove Alloy Steels

All present code construction designs, either American Society of Mechanical Engineers or American Petroleum institute. are based on a safety factor of 5 or 4 and working stresses of ordinary steel are used as engineering data. Much work is to be done to prove that higher-strength, properly-balanced alloy steels can present to the designer permissible stresses above those now set down for plain steel. A joint committee is at work and shortly it is believed that new and higher allowable working stress tables will be adopted, thereby permitting advantage to be taken of the higher physical properties. To be fair and safe, much technical data must be collected and summarized in order that designing engineers, operators and inspecting groups may have confidence in the values to be established.

From judicially mixed or single alloys one should expect some or combinations of several of the following properties above those obtained in ordinary plate stock:

High strength at elevated temperatures.

High impact resistance at upper working temperatures.

Definitely improved creep values.

Good subzero impact ratings.

Added resistance to some corrosive media.

Better fatigue results.

To what elements can the steel metallurgist turn to provide some of these improvements in large plate form?

Automotive engineers have had at their command for years many alloy combinations, and tube buyers likewise have had a fairly broad field from which to select. Production and fabrication of small parts does not present the hazard that mass does, therefore, vessel and boiler material must come from alloy analyses which can be readily produced and constructed. Thermal effect on large and heavy sections has to be dealt with, consequently shell and head materials are available today in alloy steels which are not so sensitive to the various stages of making and shaping. The fear of hazardous workability must not be foremost.

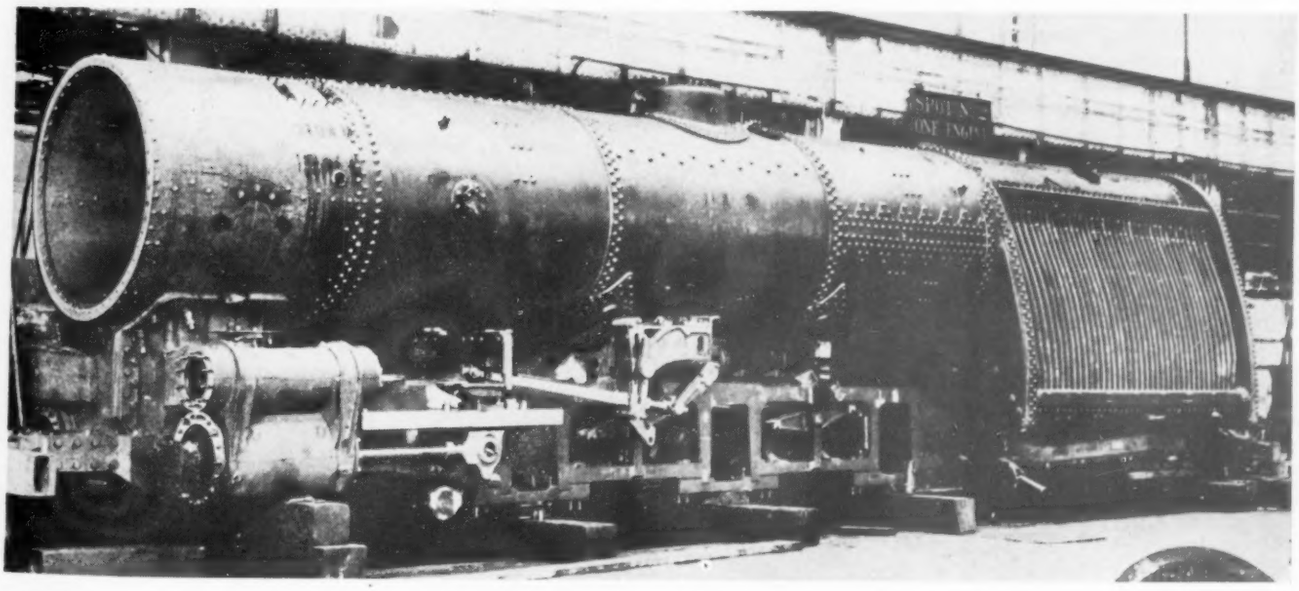
### Strengths Not at Maximum

Note should be made here that for welded construction, the codes have listed among acceptable specifications only plain carbon steel for shell fabrication, and, however significant this fact may be, the day is not far distant when several alloy combinations must become essential parts of material specifications. High strengths have not reached their maximum and as the welding art has changed its acceptable standard, so will limits of pressure, temperature and base material; and the next great step undoubtedly will be toward base material having a minimum of 100,000 pounds per square inch tensile strength. The demands are present, the methods of production and fabrication are progressing and developing by experimentation, and slowly but safely the knowledge needed for achieving this goal is being gathered.

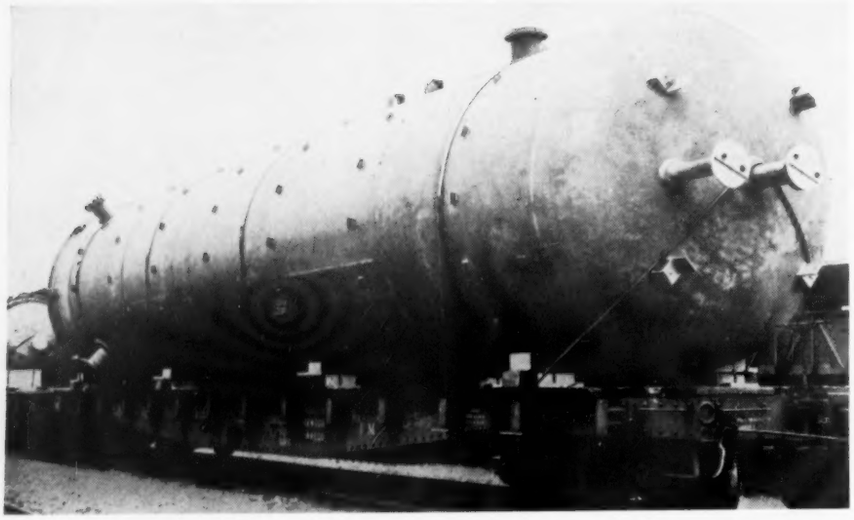
### Must Avoid Air Hardening

As stated previously, alloying elements for plate construction must not exhibit pronounced air hardening characteristics. The application of intricate or even simple heat treatments are not always advisable; quenching and tempering and long time furnace annealing are always accompanied by out-of-flatness and warpage, making plate fabrication difficult if not impossible. So, in existing developments steels are being offered which have the improved qualities in the "as rolled" condition. Keeping this problem foremost, the full benefit of all the nonferrous elements cannot be had. Equipment to some extent limits the production of the more special alloys requiring special treatments, but with the hoped for industrial expansion it is to be expected that progress will not be retarded.

The common alloying elements of nickel, chromium, silicon, molybdenum and vanadium have been used with remarkable success. By use of small percentages, steelmakers have been able to produce some of the qualities which should be expected from a higher base price material.



*Nickel alloy steel was used in the boiler and firebox of the new high-speed, streamlined steam locomotives, Lord Baltimore and Lady Baltimore, of the Baltimore & Ohio railroad. The steel was supplied by the Lukens Steel Co. These locomotives carry 350 pounds boiler pressure*



*Pressure vessel used in the oil industry in subzero service, built by A. O. Smith Corp., Milwaukee, from plates and flanged heads furnished by the Lukens Steel Co.*

One of the chief outstanding metallurgical advantages of the use of the elements mentioned is the maintaining of high strength by substituting one or more of these elements for increased percentages of carbon. Thus, with the so-called low alloy content steel, carbons need not exceed or even reach the limit of maximum 0.25 per cent, as used in a 55,000 pounds per square inch tensile strength steel, to produce tensile values over 50 per cent higher than this figure. This advantage undoubtedly is attractive to the welding engineer.

Unfortunately, there has existed in the minds of some users a suspicion or feeling of mystery about alloys. The metallurgical benefits from contained elements require only a simple understanding to alleviate such suspicion. Some regard for the properties imparted may slightly change fabricating methods, but not to such a degree that any ordinary well equipped Class 1 welder need fear his ability to construct. Nickel, chromium, silicon, etc., are used to improve the steel, not to make it more mysterious. Stiffness of alloy material is to be expected, but so long as brittleness does not accompany the higher strength, the resulting toughness is an advantage. All tonnage to date has been preceded by experimental work and it would not be amiss to discuss a few of the rather recently used alloy materials which have proved themselves worthy of the confidence intrusted to them.

### Railroads Using Nickel Steel

A 2.0 per cent nickel steel with carbon under 0.20 per cent pioneered by a Canadian railway in a large locomotive construction program, has served so well that many railroads in the United States have installed wrapper sheets of this analysis. The tensile strength of 75,000 pounds per square inch permitted a decrease in shell section, and although the shell is subject to the stress of locomotive service, the excellent ductility of this type of steel, as shown in Table I, has proved its merit. Even inside firebox sheets with an ultimate of 65,000 pounds per square inch have been installed, and longer life of the side sheets with minimized crowfeet checking around staybolts has been noted.

### Impact at Low Temperatures

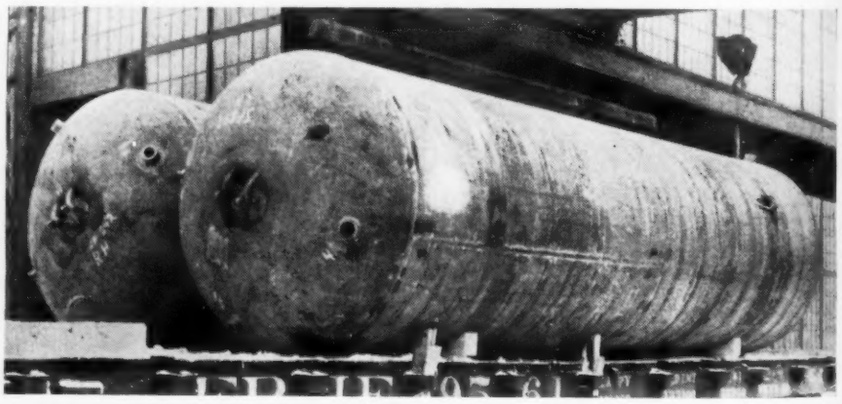
This same analysis has found an opposite although very important use in subzero service. Here the added nickel definitely increases and makes uniform impact values even at temperatures as low as —100 degrees Fahr. Charpy impacts of 15 foot-pounds at —75 degrees Fahr. can be obtained consistently, as shown in Table II. This alloy provides for the dewaxing process of the refining industry a metal whose resistance to shock at low working temperatures is far better than any plain carbon steel, as shown by results consistently obtained to date.

For its high tensile steel, for example, 80,000 pounds per square inch minimum tensile strength, the United States navy found it advisable to list in its hull steel specification a manganese-vanadium grade of the following typical analysis. Carbon, under 0.18; manganese, maximum 1.45; and vanadium 0.08 to 0.18 per cent. Numerous tests carried out in Washington indicated to the bureau of construction and repair that this analysis exhibited less tendency to air harden in the welded zone than some other steels so tested. Ship welding varies definitely from pressure vessel welding in that stress relieving or heat treatment after welding is impossible.

### Would Effect Weight Saving

Consider now this analysis and its possibilities because of the particularly high ratio between yield point and tensile strength, as shown in Table III. If the yield point could be taken as a basis of determining allowable working stress in code designing, this steel would present a big advantage in weight saving.

Due attention is just beginning to center around carbon-molybdenum plate steel with carbon under 0.25 per cent and molybdenum between 0.40 and 0.60 per cent. Tubes of this grade of steel have been used successfully and the plate industry is now arousing to the advantage that molybdenum gives, that is, definitely improved physical properties at elevated temperatures. One has only to scan the creep values of



*Fusion welded pressure vessels, 72 inches diameter and 23 feet long, fabricated by Babcock & Wilcox Co., Barberton, O., from nickel-clad steel supplied by Lukens Steel Co. The vessels were designed for working pressure of 100 pounds per square inch with stress carried only in the steel. Construction was made in accordance with A.S.M.E. code for Class 1 welded vessels and all welds were X-rayed. These vessels were fabricated from the largest corrosion-resistant clad metal plates ever rolled; the plates were 118 inches wide, 228½ inches long and 9/16-inch thick, with 20 per cent nickel cladding on one surface*

carbon-molybdenum steel and compare them with values on steels of equivalent room temperature strength, to note the imparted improvements.

Advantage has been taken of this element in Europe for years. In plate and vessel material, room temperature strength of 75,000 pounds per square inch can be obtained easily. Units of this grade are in service in an eastern refinery, and the latest information indicates complete realization of anticipated results.

Mention was made previously that the American Society of Mechanical Engineers' boiler code had not adopted any alloy grade steel for welded construction and this is true. However, one alloy specification, namely S-28, has been approved for riveted construction. Such rapid and satisfactory progress has been made with this "C.M.S." steel that obviously early recognition for welded vessels is looked for. This C.M.S. specification, as listed in trade name, represents an alloy called Cromansil.

### Steel Finding Wide Use

This steel is made and listed in two grades, for example, minimum 75,000 pounds per square inch and minimum 85,000 pounds per square inch tensile strength. The carbon content in the first grade is limited to 0.17 per cent maximum, while the 85,000 pounds per square inch minimum class permits a 0.25 per cent maximum carbon. The name of this popular low alloy—Cromansil—reveals its chief components—chromium, manganese and silicon. Each of these elements is found in the following ranges: Chromium, 0.30 to 0.60; manganese, 1.05 to 1.40; and silicon, 0.60 to 0.90 per cent. The metallurgical balance of these three toughening elements has made possible a very versatile and workable low alloy steel of good high strength properties without the decided loss of the very necessary property of ductility. Composition and properties of this steel are shown in Table IV.

The merits of any material are best substantiated by its use, and actual tests are worth many expert opinions. The many tons of this steel most successfully welded into diesel engine frames and housings of various intricate shapes and thicknesses, and the complete power units developing around 600 horsepower at 1200 revolutions per minute with the accompanying vibratory stresses, prove beyond a doubt that this alloy has weldability and toughness which warrant favorable consideration. Taking advantage alone of the high strength of the 85,000 pounds per square inch minimum grade, weight reductions are so evident that attractiveness cannot be denied.

Nickel and chrome-clad material has been produced with corrosion resistant properties which present to users very definite savings. The strength of plain steel base material can be used for computing working stress and the thin layer of cladding, securely bonded, can be depended upon to resist the corrosion for which it is recommended. Ten and 20 per cent nickel-clad plates have been successfully produced, fabricated and fusion welded to Class 1 requirements of the A.S.M.E. boiler code. Vessels so constructed meet a long sought need, particularly in the chemical industries.

The manufacturing methods of this nickel-clad material have been so developed that uniform thickness of the cladding is assured, and the bond between the layer of nickel and the base steel is a metallurgical one. The good physical properties of the base metal are not impaired by this bonded layer of nickel since this element alone is strong and ductile. Satisfactory welded joints can be made by using ordinary steel rods on the base metal side, and pure nickel rods on the clad side, thereby making a continuous lining of pure nickel.

Other combinations of alloys worthy of consideration are being offered and developed for various purposes. The appreciation of improved quality is foremost today, and one of the very necessary aids for this development is the addition

(*Please turn to Page* 48)

**Table I**

## Chemical and Physical Properties of 2.0 Per Cent Nickel Steel Plates

| —Analysis, per cent— C. | Mn. | Si. | Ni. | Thickness, inches | Yield point, pounds per square inch | Tensile strength, pounds per square inch | Elongation in 8 inches, per cent |
|---|---|---|---|---|---|---|---|
| 0.13 | 0.52 | 0.20 | 2.10 | ½ | 52,500 | 76,000 | 28.00 |
| 0.16 | 0.56 | 0.21 | 2.25 | ¾ | 44,000 | 75,000 | 28.50 |
| 0.16 | 0.57 | 0.25 | 2.08 | ⅞ | 47,000 | 75,600 | 26.00 |
| 0.17 | 0.66 | 0.23 | 2.23 | 1 | 49,300 | 82,000 | 26.25 |
| 0.16 | 0.56 | 0.21 | 2.25 | 1 | 46,600 | 75,500 | 29.00 |
| 0.18 | 0.68 | 0.19 | 2.90 | 2 | 47,800 | 79,000 | 23.70 |

**Table II**

## Impact Strength of 2.0 Per Cent Nickel Steel Plate

| —Analysis, per cent— C. | Mn. | Si. | Ni. | Thickness, inches | Charpy impact, foot-pounds —50 deg. Fahr. | —75 deg. Fahr. | Condition of steel tested |
|---|---|---|---|---|---|---|---|
| 0.16 | 0.62 | 0.18 | 2.22 | ½ | 31–33–35 | 17–22–23 | As rolled |
| 0.15 | 0.49 | 0.19 | 2.03 | ⅝ | 31–29–34 | 19–21–22 | As rolled |
| 0.16 | 0.48 | 0.19 | 2.10 | 9/16 | 39–39–39 | 32–32–30 | As rolled |
| 0.18 | 0.54 | 0.19 | 2.10 | 15/16 | 35–38–36 | 20–24–20 | As rolled |
| 0.18 | 0.66 | 0.24 | 2.24 | 1⅛ | 32–35–35 | 18–22–20 | As rolled |

**Table III**

## Chemical and Physical Properties of Manganese-Vanadium Steel Plates

| —Analysis, per cent— C. | Mn. | Si. | V. | Thickness, inches | Yield point, pounds per square inch | Tensile strength, pounds per square inch | Elongation in 8 inches, per cent |
|---|---|---|---|---|---|---|---|
| 0.15 | 1.40 | 0.20 | 0.13 | ½ | 59,800 | 87,200 | 24.00 |
| 0.15 | 1.40 | 0.20 | 0.13 | ½ | 63,600 | 92,600 | 20.00 |
| 0.16 | 1.43 | 0.22 | 0.10 | ½ | 65,000 | 89,600 | 22.75 |
| 0.16 | 1.43 | 0.22 | 0.10 | ⅝ | 61,700 | 93,600 | 20.00 |
| 0.15 | 1.40 | 0.20 | 0.13 | ⅞ | 62,600 | 92,000 | 24.25 |
| 0.16 | 1.43 | 0.22 | 0.10 | ⅞ | 64,600 | 92,000 | 23.50 |

**Table IV**

## Chemical and Physical Properties of Cromansil Steel Plates

| ——Analysis, per cent—— C. | Mn. | P. | S. | Si. | Cr. | Thickness, inches | Yield point, pounds per square inch | Tensile strength, pounds per square inch | Elongation in 8 inches, per cent |
|---|---|---|---|---|---|---|---|---|---|
| 0.12 | 1.12 | 0.030 | 0.017 | 0.55 | 0.54 | ¼ | 60,000 | 80,400 | 25.00 |
| 0.12 | 1.12 | 0.030 | 0.017 | 0.55 | 0.54 | ¾ | 47,100 | 76,300 | 27.00 |
| 0.14 | 1.26 | 0.035 | 0.022 | 0.77 | 0.47 | 1 | 55,600 | 80,200 | 26.50 |
| 0.21 | 1.17 | 0.014 | 0.024 | 0.72 | 0.47 | 2 | 53,200 | 85,600 | 20.00 |
| 0.14 | 1.24 | 0.010 | 0.018 | 0.76 | 0.47 | 3 | 45,600 | 77,400 | 21.25 |
| 0.20 | 1.28 | 0.027 | 0.018 | 0.73 | 0.52 | 1½ | 54,000 | 88,200 | 22.75 |

*Merchandise container constructed of the new alloy steel was assembled by spot welding and continuous arc welding*

# CHROMIUM ALLOY STEEL

## Has High Strength, Resists Corrosion and Can Be Welded, Hot and Cold Worked and Machined

DEMONSTRATING the application of its new rustless, high strength steel known as RR-11, Rustless Iron Corp. of America, Baltimore, now is exhibiting in a number of key cities a hopper car and a merchandise container built of this material.

Of the twin hopper type, the car has capacity, level full, of 2305 cubic feet. Its light weight is approximately 33,000 pounds and its maximum revenue load capacity 136,000 pounds. Thus the revenue load to total weight ratio is 81 per cent.

Sheets for the sides and ends are 3/32-inch, for floors, cross ridge and hopper sides inside ⅛-inch, hopper sides outside ⅛ and 3/16-inch, doors 5/32-inch and stakes ⅛ and ¼-inch thick. The underframe is of high tensile steel castings. Inside length of the car is 35 feet and inside width is 10 feet 4¼ inches.

The new RR-11 steel was developed especially to meet corrosive conditions, other than atmospheric, encountered in many types of railway and other services. The company declares that, except for wrecks or similar mishaps, the body of a car built of this steel will not require replacement during the life of the underframe. In addition, it has much higher strength than mild steel, thus permitting lighter weight construction.

### No Preservative Coating Is Needed

Preferred analysis for the new alloy includes upward of 11 per cent chromium and 0.05 to 0.07 per cent carbon. It may be used within a wide range of physical values, from 70,000 to 150,000 pounds per square inch tensile strength. Typical values are: Ultimate tensile strength 90,000 pounds per square inch; yield point 65,000 pounds per square inch, elongation in 2 inches 15 to 25 per cent (depending on gage); hardness 185 brinell and Izod impact 90 foot-pounds. Impact resistance is said to be excellent, even at sub-zero temperatures, varying in accordance with tensile strength and hardness.

In applications where appearance is of secondary importance, such as the hopper car, the new alloy may be placed in service in the as rolled condition, with painting as a preservative unnecessary. Hot rolled sheets with pickled finish, the company states, present an attractive appearance while, when the sheets are cold rolled, a bright, dense surface is obtained.

The new alloy is unusually resistant to abrasion. Its resistance to deformation at elevated temperatures is greater than that of the conventional structural steels but it flows readily and can be forged and hot pressed over a wide range of temperatures. The temperatures most suitable for such working vary between 1500 and 2200 degrees Fahr. To facilitate subsequent shearing, punching or machining operations, it may be desirable to temper by heating for a short time at 1100 to 1400 degrees Fahr. and air cooling. Sheets and light plates made of this alloy also readily may be cold formed and pressed, within limitations imposed by its higher strength.

Sound, dense and tough welds are readily obtainable. The shielded arc method, using flux coated electrodes of approximately the same composition as the parent metal, is recommended. Rivets made of this alloy have been found satisfactory; small

rivets may be driven hot or cold while the larger sizes usually are hot driven. In single shear, these rivets have shown a shear value in excess of 75,000 pounds per square inch. A caution is that the rivets must not be heated above 2250 degrees Fahr. Bolts and nuts having a wide range of physical properties are available in the new alloy; threads may be cut on an automatic machine or may be rolled in the small sizes.

The modulus of elasticity of RR-11 is the same as that of conventional structural steels, namely, 29,000,000, so that the new alloy, being stronger and tougher, safely will permit greater elastic deflection.

**Many Companies Participate**

The new car was designed by the Unitcast Co., Toledo, O., which also furnished the cast steel superstructure parts. Construction was by the Ralston Steel Car Co., Columbus, O. Sheets and plates of the new alloy were produced by the American Rolling Mill Co., Middletown, O. Other companies participating in the work were American Steel Foundries, Ajax Hand Brake Co., Buckeye Steel Castings Co., General Steel Castings Corp., Gould Coupler Co., Harrison Dustguard Co., National Malleable & Steel Castings Co., Railway Steel Spring Co., Schaefer Equipment Co., Union Metal Products Co., Westinghouse Air Brake Co. and Wine Railway Appliance Co.

The merchandise container, built by the Heintz Mfg. Co., Philadelphia, was constructed of corrugated sheets and channels by the spot welding process, with panels assembled into the body by continuous arc welding. The container is 7 feet 2½ inches wide, 9 feet 3⅜ inches long and 9 feet 4 1/16 inches high. The inside overall is 6 feet 7½ inches wide, 8 feet 3⅞ inches long and 7 feet 5¼ inches high. Volume capacity is 428½ cubic feet. Total weight of the container is 1300 pounds, including 1105 pounds of the new alloy and 195 pounds of wood floor lining.

*Twin hopper car, now being exhibited in key cities, has a superstructure of a new high strength, rustless chromium steel alloy. It is claimed that such a body will not require replacement during the life of the underframe*

## Install Steel Bifolding Doors on Normandie's Dock

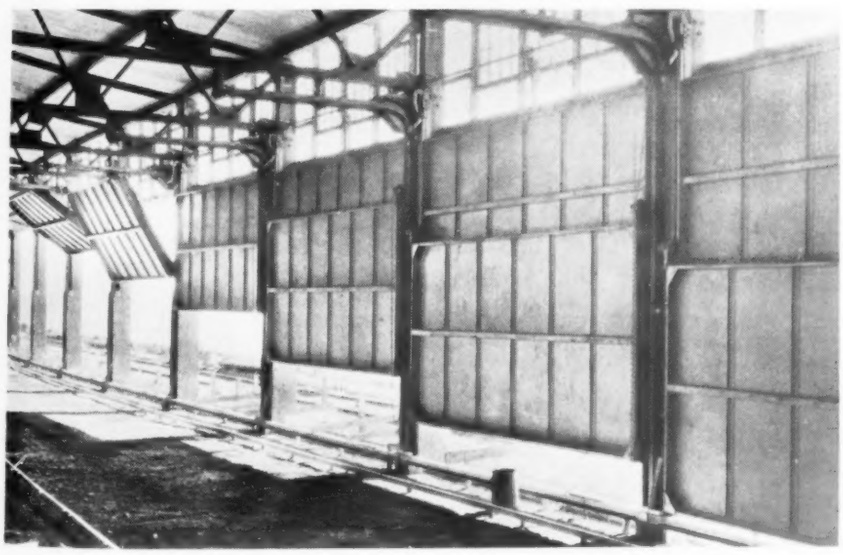
When pier 88 was built by the New York dock board for docking the huge French liner NORMANDIE, it was provided with steel bifolding doors manufactured by the Kinnear Mfg. Co., Columbus, O. They range from 18 x 18 to 37 x 18 feet and are made of 14-gage galvanized sheets on frames built of steel angles 4 x 4-inch or larger; in their construction approximately 350 tons of the galvanized sheets was consumed.

Pier 88 is unique in that it has three decks. The bifolding doors, shown in the accompanying illustration, are so arranged that they provide a barrier or gate for the openings on the upper decks. After the lower section has been telescoped with the upper, the two sections are slid to the overhead position on heavy steel tracks. If desired, the bottom section may be disconnected, thereby remaining in place when the upper section is opened in the normal manner.

**Also Installed on Pier 32**

Counterbalancing the doors are cylindrical, cast iron weights, weighing altogether about 700,000 pounds. With this arrangement an expenditure of only about 15 pounds of energy is required to set each door in motion. Ball bearings are used at all points and the chain lifting mechanism is provided with cut steel gears. To prevent the doors from falling in case of breakage of the lift chains, they are provided with safety drop locks similar to those employed on elevators.

Doors of the same type have been installed on Pier 32 now being completed in New York harbor. They were selected for these two installlations for a number of reasons. They open upward and thus save floor and wall space. They operate easily and rapidly. They afford protection against weather and are burglarproof. They also provide a fire guard which is acceptable to the underwriters.



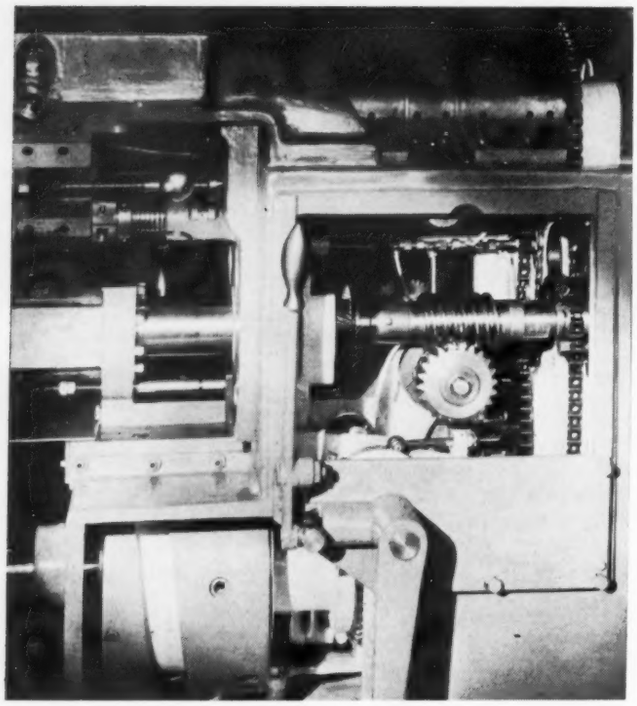
*Approximately 350 tons of galvanized sheets, a large tonnage of steel angles and 700,000 pounds of cast iron counterweights were consumed in building bifolding doors for Pier 88, New York harbor*

## Approved Standards for Jig Bushings Available

The American standard for jig bushings, recently approved by the American Standards association, has now been published. The standard gives dimensions for press fit wearing bushings (headless and head types), renewable wearing bushings (slip and plain types), and liner bushings (headless and head types). Included are tables for dimensions covering range of hole, body diameter, length, width of chamfer, head diameter and head height. Hole sizes are in accordance with the proposed American standard for twist drill sizes.

This standardization project was sponsored jointly by the American Society of Mechanical Engineers, Society of Automotive Engineers and National Machine Tool Builders' association.

Copies of the standard, B5.6-1935, can be obtained from the sponsors or from the American Standards association, 29 West Thirty-ninth street, New York, for 35 cents per copy.



*Interior of the power case, showing the cam drum for operating the auxiliary slides and the main cam drum for operating the turret*

# Accuracy Keynote in Design Of New Screw Machines

AFTER five years of rigid economy, with industrial plant replacements curtailed to bare necessities, the national machine shows wear. It is rickety and chattering in many spots. In this much maligned machine age, the machine has been wearing out. Taxed to produce manufactured goods economically by even moderate demand, not until the last few months has there been a trend toward scattered replacement of machine tool equipment.

The depression, generally speaking, has not halted progress in engineering, science or invention. Sharper competition has served to accelerate these important branches of business. Especially is this true of the machine tool industry. Few builders or machinery have failed in the last few years to bring out new lines and models embodying features in design and materials which overshadow in economical production their predecessors of predepression days.

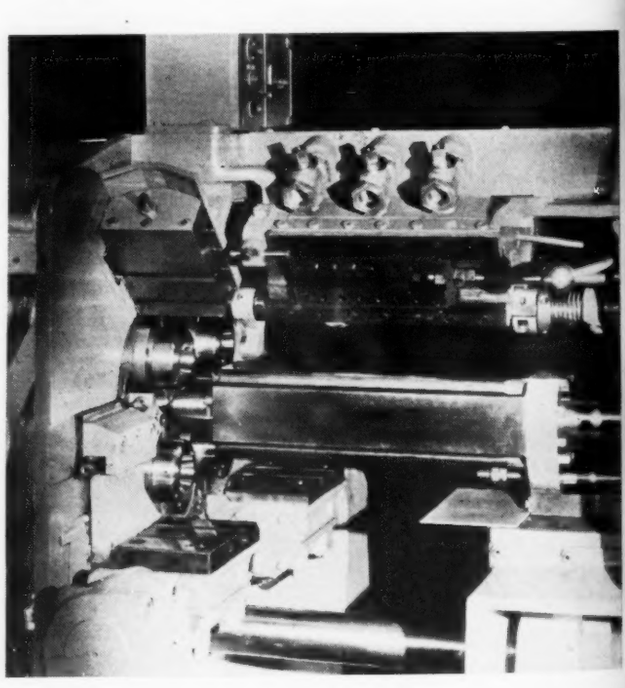
Great advances have been made in automatic operation, design, steel and other materials used in machinery construction, output, safety, accuracy and flexibility. Development of a new line of automatic screw machines by the New Britain-Gridley Machine Co., New Britain, Conn., is a case in point. Initial accuracy and permanency in this accuracy dominate the design. Retaining basic screw machine practice of proved worth, the New Britain organization has developed exclusive features in which design and materials are linked together.

These high-speed four and six spindle tools, are equipped with preloaded ball bearing spindle mountings, which under heaviest cuts allow no radial or axial deflection. Spindles are shorter than the average, but extra large in diameter to obtain rigidity. Preserving initial accuracy, the spindle carrier is equipped with an automatic lifting device, the carrier being raised during indexing, eliminating wear on locating surfaces. To prevent weaving during the cutting cycle, the carrier is automatically clamped after indexing. The spindle carrier is also extra large in diameter, practically an integral unit with the tool slide stem. The carrier is finished to close limits for the spindle mountings and is fitted with hardened and ground locking bolt slots, accurately spaced. The carrier rests on locating pads, being lifted off the pads during the automatic indexing operation.

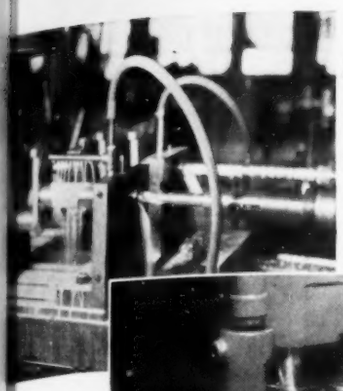
### Control of Indexing

An indicator on the headstock shows instantly whether or not the carrier is being properly lifted for indexing. After the indexing operation, the carrier is locked on the pads, two spring-controlled levers, one the locking unit and the other a locating lever, operating practically simultaneously, the device being equipped with three cam shafts, all in unison. Indexing is done quickly and accurately.

With a selective range of spindle speeds from 199 to 2485 revolutions per minute on stock to and including 1¾ inches, the machines have a selective range from 137 to 1715 revolutions per minute on 2-inch and 2¼-inch capacity. The spindle carrier has a maximum permissible

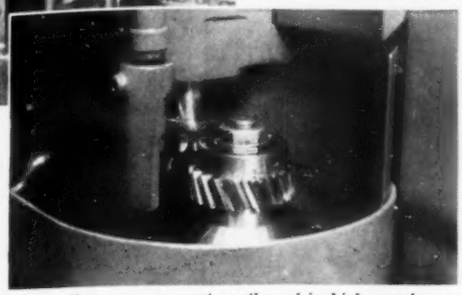


*Spindles and tool slides are readily accessible. This view also shows the new circular bearing cross slides and location of the cross slide and tool slide cam compartments, entirely away from chips, dirt and the like*



*At left:* Drilling main journals of aircraft engine crankshafts. Photo courtesy Union Drawn Steel Co.

# *The more difficult the operation . . . the greater the* COST-IMPORTANCE *OF CORRECT LUBRICATION*



*Above:* Transparent cutting oil used in high speed gear shaping. Photo courtesy Fellows Gear Shaper Co.

YOU know that to increase speeds, feeds, depth of cuts—and still maintain or improve the finish of the work—demands increased care in the selection and application of cutting oils. You know, too, that the more *difficult* the cutting operation, the more important this lubricant selection becomes—*vital* both to quality of work, and *cost of operation*.

Standard Oil (Indiana) men have set down suggestions from their own practical experience in the booklet: "How to Cut Costs in Difficult Cutting Operations." You can have a copy of this booklet, and any of the others listed on the coupon. Check them now.

You can always have the personal help of men from your local Standard Oil (Indiana) office. Call them in. *Challenge them to show you ways to save* on your more difficult cutting operations.

*Below:* Broaching a keyway on a La Pointe Hydraulic Broaching Machine. Photo courtesy Foote Bros. Gear & Machine Co.

## *ACME CUTTING OILS*

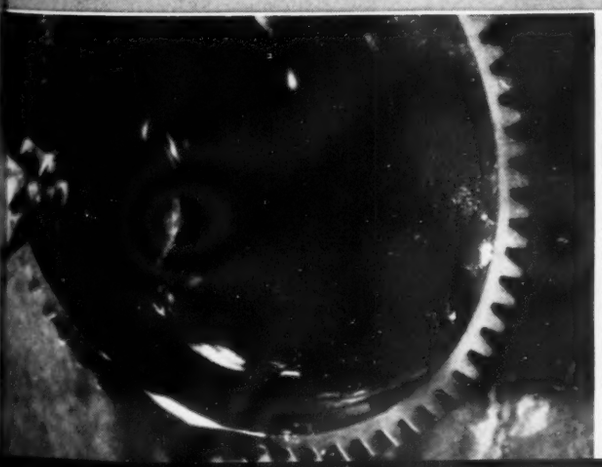
Acme Cutting Oils are made in four viscosities and will meet all conditions. One of the great advantages of Acme Cutting Oils is that they contain more than 4% sulfur in chemical combination with the oil. This high sulfur content (which will not separate from the oil regardless of age) places Acme Cutting Oils above ordinary compounded oils in results obtained.

## *PREMIER CUTTING OILS*

Premier Cutting Oils are lighter in color than Acme Cutting Oils. They are designed to do the same work, and, because their lighter color makes it possible to see the work, sometimes are preferred. Like Acme Cutting Oils, Premier Oils are high in sulfur content, containing more sulfur in chemical combination than any other light oils on the market.

CORRECT LUBRICATION

# STANDARD OIL COMPANY (INDIANA)



Standard Oil Company (Indiana)
910 S. Michigan Avenue, Chicago, Illinois (149)

Gentlemen: Kindly send copies of the papers checked to the undersigned. It is understood that no obligation is implied.

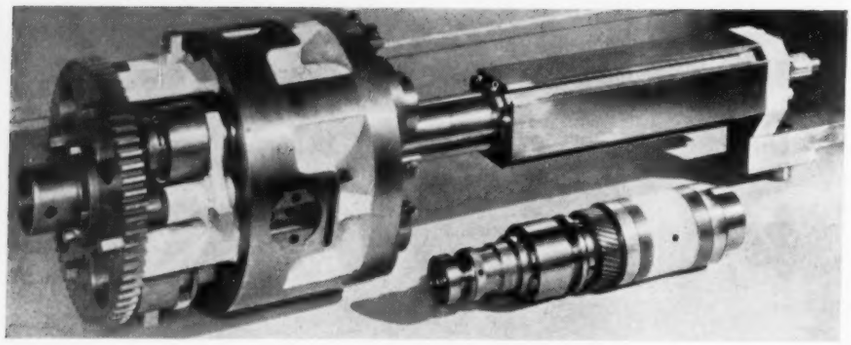
☐ "Quenching and Tempering Oils" ☐ "Metal Forming Lubricants" ☐ "Lubrication in Grinding Operations" ☐ "Lubrication in Gear Cutting Operations"
☐ "Lubrication in Honing & Lapping Operations" ☐ "The Lubrication Engineer—His Value to You" ☐ "How to Cut Costs Through Correct Lubrication in Difficult Cutting Operations"
(attach list of any additional subjects in which you are specifically interested . . . . . .)

*Name* . . . . . .

*Position* . . . . . *Company* . . . . . .

*Address* . . . . . .

*City* . . . . . *State* . . . . . .



*Assembly of the spindle carrier unit, together with the intergral stem and the square reciprocating tool slide. Note hardened stem inserts for the locking mechanism and the preloaded ball bearing spindle mounting on the spindle. New spherical roller type of chuck operating device also is shown*

variation, radially, tangentially and parallel of plus or minus 0.0005-inch, permitting test cuts with 0.001-inch limit for diameter and parallelism.

Cross slides, one for each spindle, are all independent and mounted on circular studs, aiding in chatter elimination. Cross slide bearings are entirely enclosed with no chance of chips or grit reaching bearing surfaces. Gears and cams operate inside the headstock. Slides are fitted with hardened and ground tool holder bases, tee slots of which are ground to size, parallel with the axis of the spindle, eliminating broken tee slots. Fitted with micrometer adjustment, tool holder bases are accurately and quickly adjusted. Cross slide cams are of the flat disk type, jig drilled, entirely enclosed and lubricated automatically. Cams are easily removable and one may be used at any of the other four cross slide positions.

### Tool Slide Is Square

The tool slide, in permanent alignment with the axis of the spindles, is square, being actuated forward and reverse with a drum-type cam through roller and torque guide plate. The latter reciprocates between hardened plates and is protected from chips and grit. An adjustable stop controls turning lengths and drilling depths. Tool slide cams are also entirely enclosed.

The auxiliary slides are entirely independent of the main tool slide. The overhead cam drum is in three sections. It is possible to ream and drill with the auxiliary slide much faster than the main tool slide operates when a quick reaming operation is required. The slide permits the use of threading, reaming, tapping and other tools requiring operation independent of the main turret at one or both of the two upper positions. Drill speeders are provided for all spindle positions, the two upper can be accelerated with the auxiliary slides.

The stock reel is definitely tied with the spindle carrier by flexible couplings for smoother indexing of work with less whipping, a distinct advantage for extra long stock. Reel tubes rotate with the stock, reducing noise and preventing burring. Tubes are lined with wood or fiber.

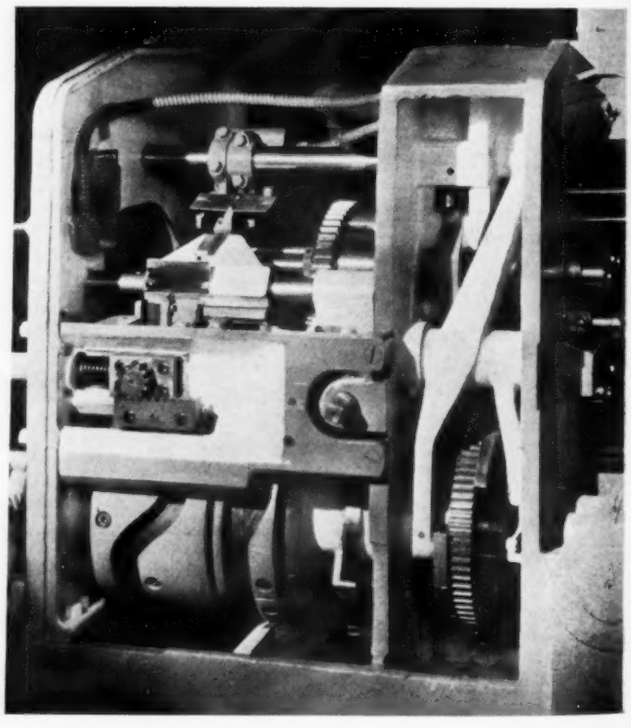
In feeding, should the feed finger strike the butt end of the bar, a yielding device on the positive stock feed cam prevents damage. The cut-off and stock feed in the upper front position enables the operator to remove a finished piece of work for inspection in his normal working position. To prevent damage by careless operation, should a stock feed tube be removed for any reason, its actuating shoe is latched out. Then, through a switch connection with the motor, the latter cannot be started until the latch is released and the stock feed tube returned to its correct operating position. In this action a trip to the stop lead guard ring throws the switch and stops the machine.

The machine automatically stops when any spindle runs out of bars with the collet open and the swing-type stock stop in position. A hand operated spring-controlled lever lifts the stock stop which automatically returns to normal position when the lever is released. The stock stop therefore cannot be left out of position. The machine is easily restocked by removing the butt end of the bar, and inserting a new bar through the stock reel. The stock step is always free of chips. The stock feed mechanism also prevents stock from crawling backward with the spindle operating when the chuck is open.

### Spherical Roller Chucking Details

An important feature is the spherical roller chucking details of these machines. A series of "barrel" or spherical roller-type bearings and wedge rings give substantially greater chucking pressure. The rolls are hardened to 60-64 Rockwell. The rolls and sleeves, inner and outer, actuated by chucking shoes give axial movement to chucking tubes with a minimum of power. The pressure is distributed over 13 hardened rolls and the chuck tube adjusting collars are readily accessible for the adjustment of chucking pressures. The chucking system is not affected by centrifugal force.

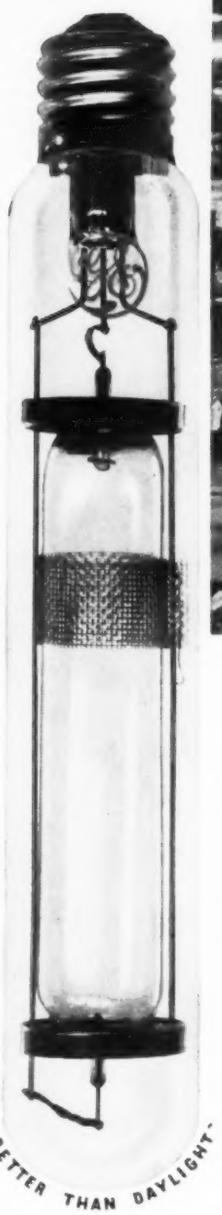
Draw-back collets are ground internally and externally to allow minimum run-out of stock. They are also equipped with felt plugs in splits to prevent chips and grit working into the seat. With self-opening dies or solid taps, the threading attachment is of the uni-



*Closeup of the stock feed and chucking end of the spindles, showing accessibility of the cross slide cam, stock feed and chucking-up cams*

# *Philco uses* BETTER LIGHT *as a* "PRODUCTION TOOL"

These G. E. High Intensity Mercury Vapor Lamps are suspended 9 feet above the floor in a combination layout. Every other outlet is equipped with 300 watt incandescent lamps. The penetrating white-light sensation produced makes seeing easy. Even minute details stand out in bold relief.




**HIGH INTENSITY MERCURY VAPOR LAMP**

Even the few shadows are luminous in the coil winding department at the plant of the Philadelphia Storage Battery Company. G. E. High Intensity Mercury Vapor Lamps make light work of the finest detail, enabling workers to see quickly and without eye-strain even the hair-fine enameled wire which they wind. This better light means better sight . . . and better, more economical production.

The daylight sensation produced by these G. E. High Intensity Mercury Vapor Lamps is pictured above. Note how free from costly shadows every work table is. The light penetrates into recesses. Even the floor is well-lighted. Halation is absent — objects are seen in their true perspective.

Insure your plant against the spoilage which is chargeable to inadequate light. By installing this new "production tool" you automatically insure more uniform production. The complete details can be had by writing to . . . General Electric Vapor Lamp Company, 885 Adams Street, Hoboken, New Jersey.

**GENERAL ELECTRIC VAPOR LAMP COMPANY**

643 Copr. 1934, General Electric Vapor Lamp Co.

versal type, transferable to both top positions. Tapping is also possible in the upper stations and self-open die threading at all four spindle positions. The automatic stop is electrically operated through solenoid which halts the machine in loading position when the stock in any spindle is exhausted. Controls allow for semiautomatic operation which permits the machine to make one completed cycle, then halting with the slides withdrawn to aid in setting up.

Among the safety features is an interlocking device which prevents the power feed engaging when the hand feed is being used. Should a jam occur, a frictional and adjustable device, without shearing pin and operated through the main cam drum prevents damage to parts. The tool lubricating system is of low pressure with a centrifugal pump capacity of 60 gallons per minute. When required, however, provision is made for a high pressure oiling system. The design provides for unusually large chip space with no interference to prevent chips dropping directly into the base where they may be removed by hand or by a conveyor.

Lubrication is of forced circulating type, with the pressure gage interconnected through a switch with the main motor, preventing operation of the machine, until a predetermined pressure has been reached in the lubricating system. In starting the machine, it is necessary to hold the starter button depressed until desired pressure is obtained. This insures ample lubrication at all times.

### Wearing Parts of Alloy Steels

Tooled up, the larger model screw machine weighs 14,000 pounds, the base and frame being cast iron. Working parts are of alloy steels, specially selected to meet the requirements of such parts. Gears are a chromium-vanadium alloy, resisting decarburization, with unusual toughness. This steel has a chromium range from 0.80 to 1.10 per cent and contains vanadium from 0.15 to 0.18 per cent. Gears are heat treated to 285-300 brinell before machining, thus retaining accuracy. This alloy can be work hardened up to 400 brinell.

All wearing surfaces not on ball or roller bearings are of nickel-molybdenum steel alloy with a nickel range of 1.65-2.00 and molybdenum 0.20-0.30 per cent. Such parts are heat treated to 600 minimum brinell. Wearing surfaces on bearings, requiring unusual toughness and wear resistance, are of S.A.E. 1045 steel, heat treated to 200 brinell.

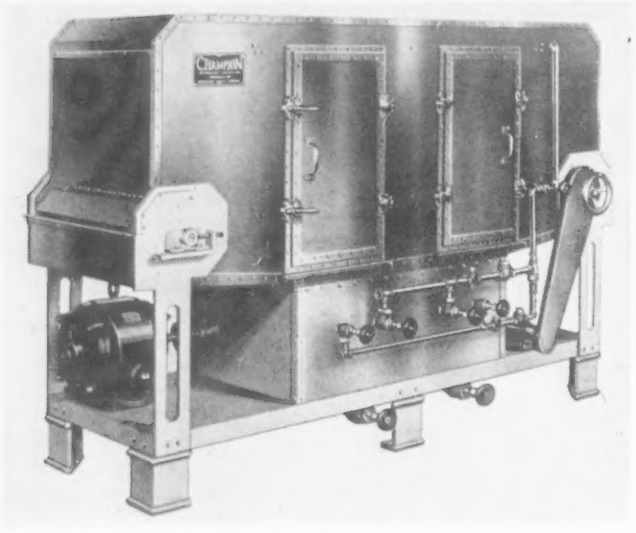
Cams are of a nickel-molybdenum steel of the same analysis as that used for wearing surfaces not on bearings and heat treated to 650 brinell. All steel parts carburized are of nickel-molybdenum alloy steel, eliminating distortion in hardness. Shafting is of carbon steel and every bearing is bushed. The tool slide is of nickel-molybdenum steel. It is estimated that 10 per cent by weight of the machine is of alloy steel in the wearing parts, and surfaces subject to wear or abuse are either nickel-molybdenum or chromium-vanadium alloy steel.

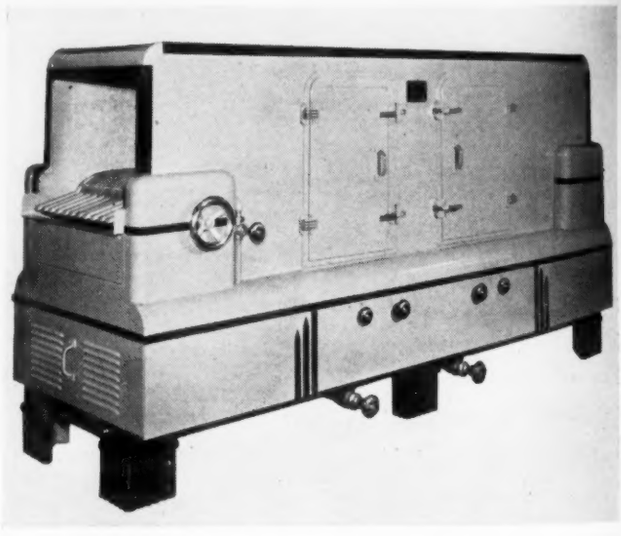
## High Yield Steel Casing Is Placed in Production

A. O. Smith Corp., Milwaukee, announces that it now is ready to supply its new High-Yield casing made by a patented process involving cold working, with a resulting increase in the compression yield strength closely approaching the ultimate tensile strength. The company's engineers state that by this new process lighter strings of casing may be run without any loss in the resistance to collapse and that drillers will be able to go to greater depths in larger sizes than heretofore.

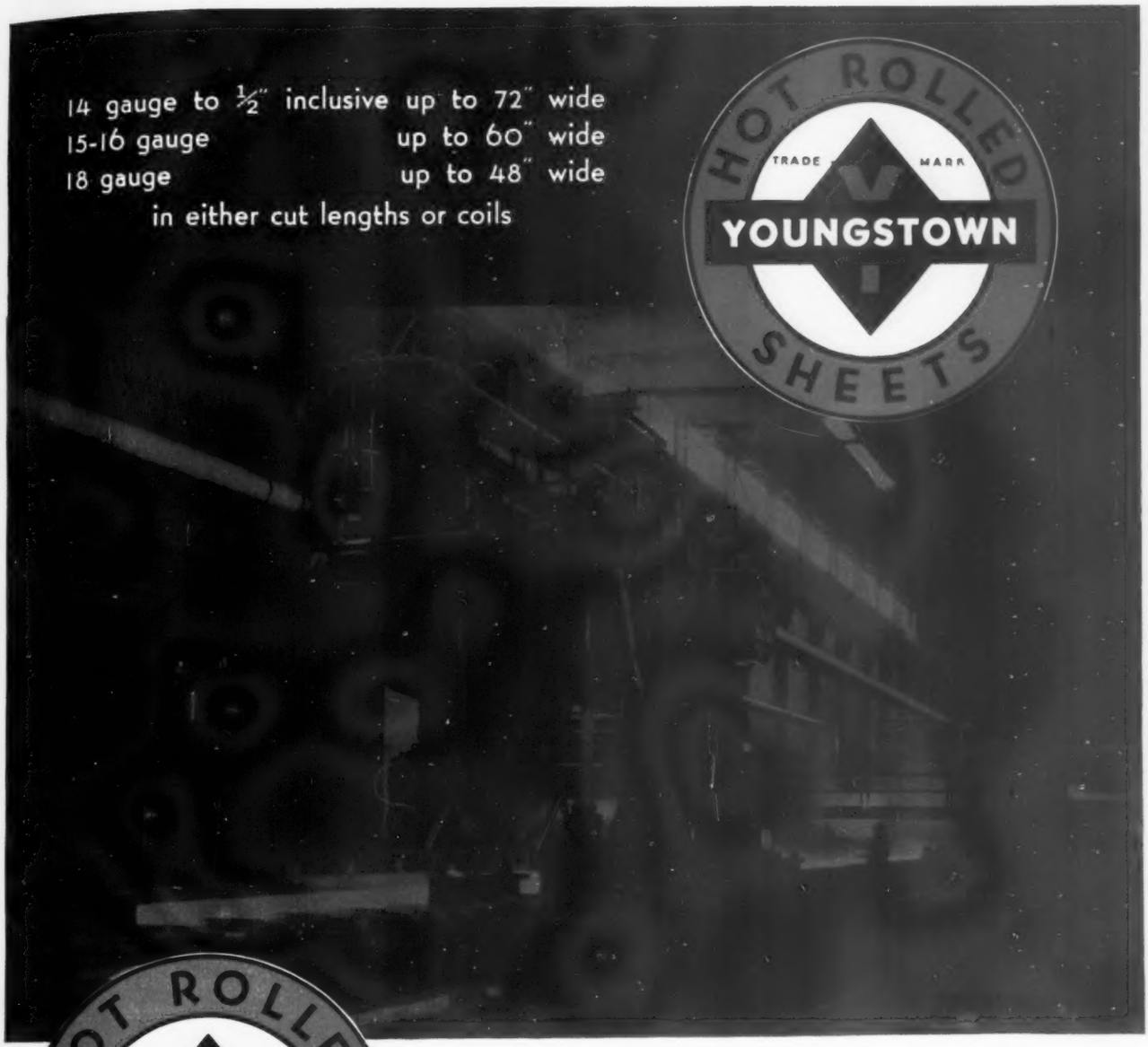
Production has been begun on 6⅝-inch and larger sizes. The casing is being made to A. P. I. standard diameters. The company now has in preparation a bulletin which will set forth the practical and scientific characteristics of the new casing.

## Before and After





*Possibilities for improving the appearance of fabricated metal products are illustrated in these views of a dish washing machine, shown in its original form at the left and as it came from the industrial stylist's hands at the right. In addition to improved appearance, the new unit has fewer dirt-catching corners and piping, a decided advantage in keeping the machine clean and sanitary. This result was accomplished without disturbing the interior mechanism, construction or method of operating the unit. From the point of view of the manufacturer, the Champion Dish Washing Machine Co., Erie, Pa., this is important because it permits production of the new model without setting up any revolutionary engineering or production problems. "In styling a machine unit of any kind," comments the stylist, Clement Thelander, Rockford, Ill., "the work is not done merely for the sake of beauty. Rather, it is done for the purpose of securing an attactive exterior that will give an unmistakeable impression of fine quality, ample size and sturdy construction. This result then will have a definite sales value by inspiring greater confidence on the part of the prospective buyer"*


14 gauge to ½" inclusive up to 72" wide
15-16 gauge up to 60" wide
18 gauge up to 48" wide
in either cut lengths or coils
HOT ROLLED
TRADE MARK
YOUNGSTOWN
SHEETS

HOT ROLLED
TRADE MARK
YOUNGSTOWN
STRIP

BY the erection of its new continuous hot mill, with capacities as listed above, Youngstown again demonstrates its determination to keep pace with today's needs and be prepared for tomorrow's demands.

520

THE YOUNGSTOWN SHEET AND TUBE COMPANY

Manufacturers of Carbon and Alloy Steels

General Offices . . . . YOUNGSTOWN, OHIO

# To Buy or Not To Buy?

ROGER N. HEALD,
President, Heald Machine Co.,
Worcester, Mass.,

## SAYS:

MODERN tools permit accuracy never before possible in the manufacture of machined parts on a production basis. They are proving profitable investments for many companies and they are helping these companies to develop lower cost and superior quality in manufactured goods.

Electric refrigerators and many other highly developed products could not be built to sell at today's prices were it not for the accuracy made possible by new tools.

A good example of what is possible with today's equipment is reflected by a new internal grinder which we have developed. This tool has made possible the finishing of many small pieces which previously had to be reamed or lapped and which, consequently, had to be made of soft material. Because this machine now is available, hardened parts may be used. These are produced more accurately, require less inspection, may be assembled more readily due to their accuracy, and wear longer in service.

### Cutting Costs on Diesel Parts

Manufacturers of diesel engine spray nozzles, both in Europe and America, long have been looking for some means of finishing the hole more economically. Formerly reamed and hand lapped —a long, tedious, uncertain operation —these nozzles now can be ground readily on the new machine.

Newly developed fixtures permit the use of these machines in grinding long holes half way from each end, turning the piece end for end between grinds; in such operations the alignment of the bores at the two ends may be maintained within 0.0001-inch. This method is employed in grinding diesel engine pump cylinders which are 2¼ inches long and have holes 0.195-inch in diameter. These cylinders are produced at the rate of one in every 12 to 13 minutes, during which time 0.004-inch of stock is removed.

A sewing machine manufacturer is using these new machines to advantage in grinding parts having both straight and tapered holes. They also are used with great success in grinding inner races with bore of 0.124-inch which are dropped out in one case at the rate of 110 per hour, perfectly round and straight and within size limit of 0.0004-inch.

### Accurate Centerless Grinding

Another new machine which affords great possibilities to manufacturers is a centerless grinder which assures equal wall thickness and perfect concentricity between the bore and the outside diameter. It is fully automatic and all that is necessary is to keep the chute full of work. Automatic, positive gages eliminate almost entirely the need for inspection and, since no reaming operation is necessary, the actual added manufacturing expense with one of these machines is nil.

An interesting grinding operation now being performed with these machines involves the bore in roller chain bushings and rollers. The wear and tear on many of the larger sizes of roller chains is severe and replacement of parts often requires shutting down of considerable equipment at large ex-

Accuracy in finishing made possible by machine tools of modern design is an important factor behind the comparatively low prices of many manufactured products in everyday use. Mr. Heald cites definite figures to substantiate this contention in his contribution to the tenth in this series of articles. Next week STEEL inaugurates a Forum on Modernization in which expressions of leading executives in all capital goods industries, including machine tools, will be presented, each designed to point out how extra dividends can be earned through intelligent rehabilitation of equipment.

pense. Accurate grinding of the rollers and bushings gives the assembled chain a more uniform pitch alignment with resulting longer life. Chains made in this way also operate with less noise.

The new centerless grinders, of course, are proving highly successful in the grinding of roller bearing races, an application where perfect concentricity between bore and outside diameter is of utmost importance.

We now are bringing out a new chucking machine to handle larger work. This machine will handle work which formerly had to be done with inadequate equipment, resulting in increased production, high accuracy and better finish.

### A Modern Fly Cutter

Another tool which makes modern manufacturing accuracy possible is a specially built machine developed by us for using a single point fly cutter with a diamond or tungsten carbide as the tool. Ideal for the softer materials, it will also bore cast iron and steel up to about 25 Rockwell. Remarkable finishes are obtained with this machine, with tolerances of 0.0003, 0.0002 and even 0.0001-inch. It may be arranged for small lot production, finishing a number of different parts simultaneously, for performing a number of operations on one part, or for large lot production, performing the same operation on multiple parts. Perfect alignment and location of the bores is made possible, when finished on this machine. In some cases roughing operations also are performed and as much as 5/32-inch depth of cut has been removed from cast iron in one pass of the tool within limits of 0.0005-inch.

### Large Profits with New Tool

A typical illustration of its possibilities is an experience with parts for an electric refrigerator. The job involved boring and facing the bronze bushing in two compressor heads and boring a cast iron cylinder, with the bore on both parts square with the face within tolerance of 0.0002-inch, and with production at 40 cycles per hour. Use of the new machine eliminated a bore grinding and face grinding operation on the cylinder and two turret lathe and one face grinding operations on the bronze compressor head bushing. Based on the planned production, the new machine effects total savings of $8350 for the year, including $6500 for direct labor and $1850 for reamer replacement and upkeep. Cost savings like this make possible a much lower sales price and the closer accuracy reduces the necessity for service or repairs.

In another typical case, involving the boring of motor end shields, the installation of this machine brought a reduction of 69 per cent in direct labor cost, 85½ per cent in the tool and reamer cost and 77 per cent in the total machining cost.

These figures are conservative. They tell their own story. Manufacturers with production problems cannot afford to overlook the profit-making possibilities which are made possible by such new tools.

# "NATIONAL" ROLL

## We specialize in

## ROLLING MILL MACHINERY

SPECIAL CHILLED ROLLS
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# ROLLS

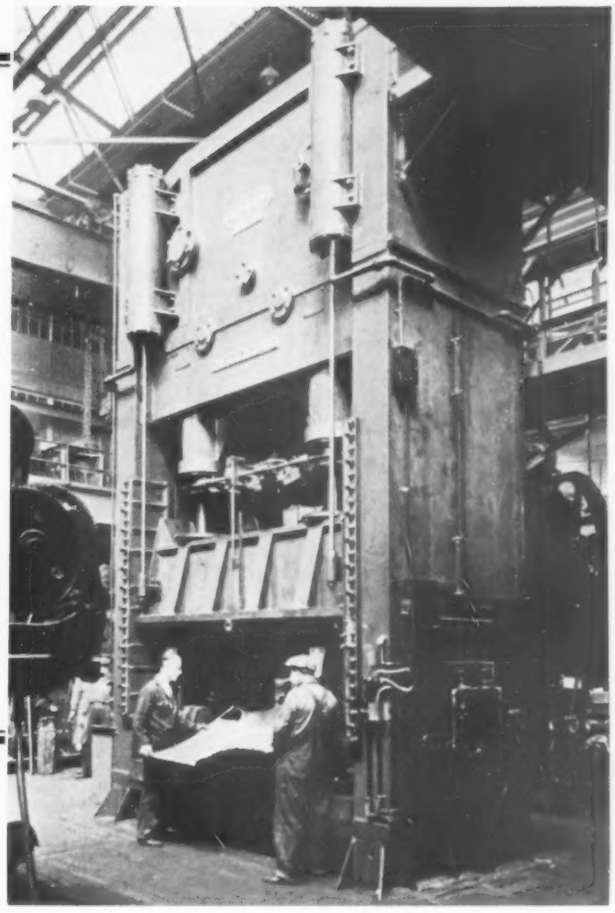
PLAIN CHILLED ROLLS
COLD ROLLS

EXTRA HARD ROLLS FOR BRASS, COPPER, ALUMINUM, ZINC

**SPECIAL CONTACT ROLLS FOR FOUR-HIGH MILLS**

**The National Roll & Foundry Company**
**Office and Works: AVONMORE, PA., U.S.A.**

# New Equipment Aids Production of Larger Auto Body Stampings



*Bed size on this 500-ton press for large stampings is 80 x 124 inches. The press is of welded steel plate construction*

FORMING of sheets for automobile bodies has become increasingly difficult with the trend toward streamlining and the use of more metal in bodies. Body stampings have been growing larger and larger with each succeeding year, often taxing the capacity of presses in body shops. Overhang of dies in some presses has approached the point where there is danger of them snapping off, the result being that presses of larger bed size are essential to smooth-running production.

A new press recently was installed by the Murray Corp. of America, Detroit, for the production of large stampings such as the quarter panels on Ford coupe models. The press, shown in an accompanying illustration, is of welded steel plate construction, weighs approximately 225,000 pounds, is 30 feet high and has a capacity of 500 tons at the start of a draw. It was built by the Cleveland Punch & Shear Works Co., Cleveland.

### Press Is Four-Point Suspension Type

The bed measures 80 by 124 inches, with openings in the bed 60 and 118 inches. Ram is 80 by 116 inches, stroke 24 inches, adjustment 32 inches and the maximum die height 56 inches. The press is of the four-point suspension type which prevents tilting of the slide, a desirable feature when there is an uneven pressure on the dies.

The slide is provided with four massive adjusting screws of the barrel type which are connected by an interlocking gear system whereby their functioning is co-ordinated. This power adjusting mechanism is controlled and operated by one of the three pushbutton controls and is designed to prevent the operation of the press at the wrong time. Adjustment cannot be made while the locking motor is set, and the press cannot be operated until the locking motor is set. The two other pushbutton controls are used for operating the press and for adjusting the ram.

Speed is eight strokes per minute, power being supplied by a 30-horsepower high-torque motor. Multiple V-belts are used to drive the flywheel which is equipped with a multiple-disk air clutch and brake. In operation, the drive pinion engages with two intermediate gears which in turn operate the four main shafts. The important feature of this design is that it constitutes a balanced drive to all four points of the slide.

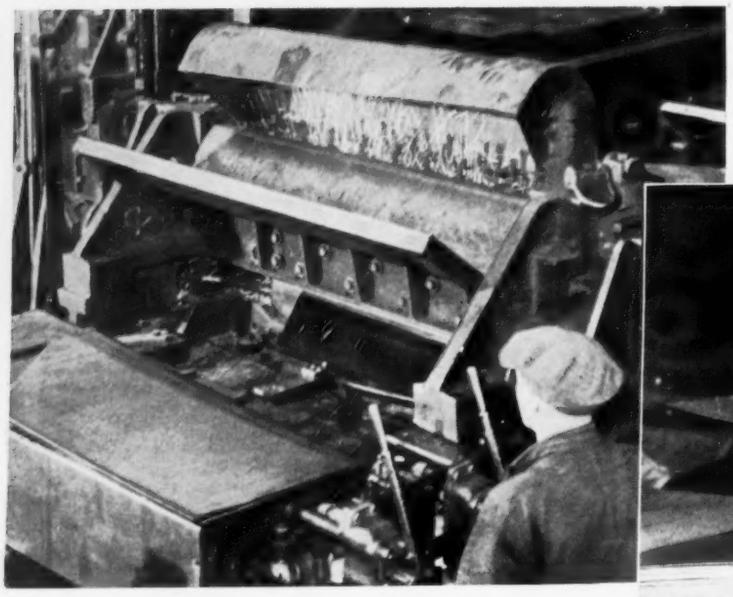
Housings are of standard rolled shapes and flat plates electrically welded. Six massive steel tierods are provided, three in each housing, shrunk into place. Four long gray iron gibs designed with stiffening ribs serve as guides for the ram, and ample provision has been made for accurate adjustment by means of bolts and adjusting screws.

Driving gears are lubricated by a force-feed system which sprays oil on the gears, the oil being returned continuously by gravity to a tank located in one of the housings.

### How Scrap Loss Was Reduced

The previously mentioned quarter panel stamping for Ford coupes is an unusually large piece—so large, in fact, that an ingenious method was resorted to in the effort to avoid excessive scrap loss and the need for extra large sheets. In preparing blanks for this stamping, a small sheet, with one side trimmed on an angle, is flash welded to a larger rectangular sheet at a rate of 100 pieces per hour. Following the welding, the blank is transferred to a flash trimmer in which two gangs of high-speed steel tools, placed in tandem vertically above and below the line of the weld, travel along the weld and trim down the weld bead flush with the face of the sheet.

After this operation the sheet is placed in a similar machine in which a series of chrome-plated tool steel rolls traverse the weld under pressure, smoothing it up and working the metal slightly. The welded sheet is then ready for press operations, following



*MAKING BIG ONES OUT OF LITTLE ONES! On this equipment, small, specially cut sheets of steel are flash welded (left) to larger sheets for more economical production of auto-body stampings. After the welding operation, the bead is cut off flush in a flash trimmer and the seam rolled smooth (below)*

which it is conveyed to the body assembly line. In the body, the line of the weld is horizontal, about on a level with the center of the small window opening in the coupe models.

This method of handling sheets for this part has resulted in an appreciable saving in material cost. No difficulties have been experienced in forming the sheets after welding and no instances have been encountered of the welds tearing apart in the forming operation.

# Poisoning of Fish Is Eliminated by Treating Cyanide Waste Solutions

THAT wholesale killings of fish by poisonous material discharged into streams by industrial plants can be prevented by treatment of the waste has been strikingly demonstrated by results obtained in a year's trial of a system installed by the Chevrolet Motor Co. at its plant in Flint, Mich., in co-operation with the Michigan state department of conservation and stream control commission.

*THIS 40-foot steel tank, lined with rubber, and provided with a 60-foot stack for carrying off poisonous gases, is operating in the Flint, Mich., plant of Chevrolet Motor Co. to convert cyanide waste solutions into a nontoxic liquid, harmless to fish, before discharge into the river*

Killings have occurred frequently in various Michigan streams, according to the stream commission, because of the large number of plants in which metal cleaning or plating operations are necessary. These processes require the use of cyanide solutions. Investigations of the University of Michigan institute of fisheries research have shown that even as little as one of cyanide to two million parts of water is toxic to fish life.

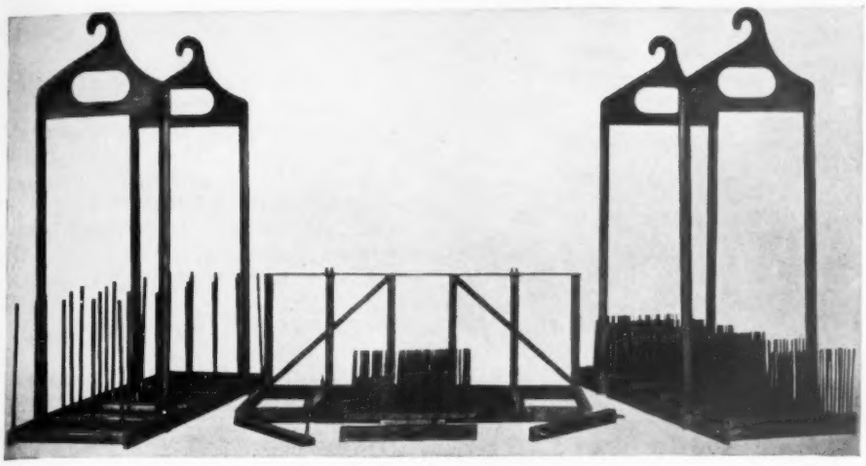
The system used at the Chevrolet plant, believed to be the first adequate installation in Michigan, is to accumulate the poisonous waste and then treat it to remove the cyanide; the remaining liquid then is allowed to discharge slowly into the river. The treatment in the storage tanks reduces the cyanide content in the undiluted solution to less than one part in one million. When this weak solution is allowed to mix gradually with the great volume of the river, the waste is immediately diluted to complete harmlessness.

In the operation of the system, accumulated waste is run into a rubber-lined steel tank 40 feet long, 5 feet wide and 4 feet deep. Recently, 4500 gallons were treated at once by the addition of more than 2 tons of sulphuric acid, followed by aeration for 16 hours. The released glasses are collected under a hood and discharged into the air under forced draft through a stack 60 feet high.

Before being treated, each gallon of waste solution contained 2.8 ounces of copper cyanide and 1.1 ounce of free cyanide. After treatment, the analysis showed less than one part per million of free cyanide, with quantities of copper sulphate and sulphuric acid so small as to be harmless.

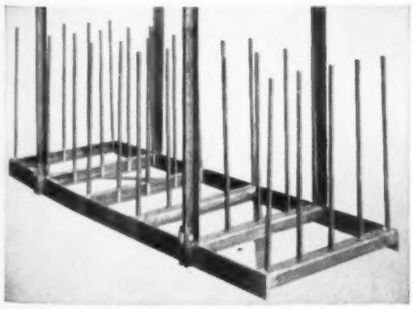
# PICKLING CRATES *that* ELIMINATE DRAG *from production*

## *Exceptionally light in weight...All-welded construction... Adjustable for character of load...and made of* MONEL METAL



*Five of these all-welded, light-weight Monel Metal pickling crates were recently built by The Youngstown Welding & Engineering Co., Youngstown, Ohio, for a steel products plant in Michigan. The crate bottoms, interchangeable spacing members, pins and pick-up device are all constructed of hot rolled Monel Metal from standard mill forms. The hooks, only, on the detachable pick-ups are cut from heavy steel plate.*

FOR MANY YEARS Monel Metal pickling crates built up of riveted rods, angles, channels and flats, have been giving satisfactory service. Now,—due to the development of Monel Metal Gas Welding Rod No. 43 which produces strong, dense corrosion-resistant welds,—even lighter, longer-lived, more economical crates are possible.



*Close-up view of one of the welded Monel Metal crates as shown above arranged with pins for wide spacing. Note the light-weight channel construction of the cross-members.*

The welded Monel Metal crate bottoms illustrated weigh only 242 lbs. each and are designed for a working load of 8,000 lbs. Similar cast bronze crates designed for the same load would weigh approximately 710 lbs.

These welded crates can be designed to be adjustable for various sizes and thicknesses of sheets . . . by providing cross-members punched for spacing the pins to suit the work. For extreme lightness, even the pins may be hollow... of heavy-wall seamless Monel Metal tubing with swaged ends closed by welding.

Latest 24-page booklet "Equipment Designs for the Pickle House," sent free for the asking.

## News Flashes

### *Solves Long-Standing Problem*

A problem which has long troubled gas companies has been solved at the Portland Gas and Coke Company, of Portland, Ore. Serious corrosion was experienced with dry vacuum pumps handling air and gases in the filtration of lamp black. The steel valve strips were so rapidly destroyed that a trial of other metals was made, resulting in the selection of Monel Metal strip.

### *Largest Ever Cast*

The largest alloy steel locomotive cylinders ever cast in this country were for the Great Northern Railway. Cast of 2% Nickel Steel. Two cylinders to a set—weighing 7,000 pounds each, plus saddle weighing 3,000 pounds; total weight, 17,000 pounds per set.

### *New Use for Nickel Wire Screens*

It is generally considered advisable to separate steel products when packing in containers for nitriding. One manufacturer suggests the use of Nickel wire screens to accomplish this. He gives the packers an ample supply of such screens of various sizes, and in this way has been able to cut down the time of packing a standard nitriding box by about 20 minutes. This plant uses standard "V" blocks of Nickel Steel for supporting long shafts and other cylindrical parts, to prevent sagging or warping during nitriding.

### *Boiler-Feed Pump Rods*

Contenders for the long-service-on-hard-duty record are the Monel Metal boiler-feed pump-rods in the Moon Island plant of the United Arcadia-Vermillion Rice Irrigating Co., Crowley, Louisiana. Back in 1925, after several seasons of pumping salt-water, examination showed little or no wear...and former packing troubles had been forgotten. At the end of 13 years' service, these rods were still on the job, according to J. W. Embry, Chief Engineer.

### *For Long Hard Pulls in Europe*

The longest main driving rods in the world are used on the specially designed locomotives of the Austrian Federal Railways that pull crack passenger trains over steep grades. These rods are made of 3% Nickel Steel, providing strength and length, but without increase of weight or cross-sectional area.

**THE INTERNATIONAL NICKEL COMPANY, INC.**
**67 Wall Street, New York, N. Y.**

Monel Metal is a registered trade-mark applied to an alloy containing approximately two-thirds Nickel and one-third copper. Monel Metal is mined, smelted, refined, rolled and marketed solely by International Nickel.

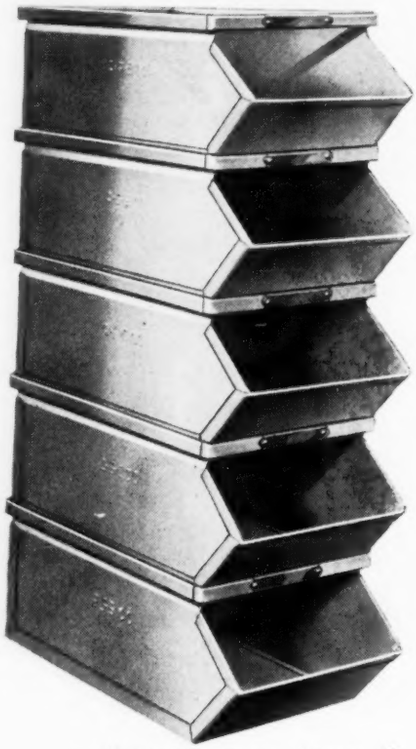
# LARGE USES OF STEEL IN SMALL WAYS

292nd Article ◆ Stacking Boxes

A PROBLEM confronting most manufacturers is that of finding a convenient and economical means for handling small parts in process and storing these parts after they have been finished. Requirements vary widely from plant to plant, depending upon the product made, therefore, it is not surprising to find many types of containers and boxes in use, some of wood and some of steel.

Because of their ability to withstand abuse and because they are easier to handle, metal containers are the more popular type. These are made in a wide variety of sizes and styles ranging from shallow trays to deeper boxes which can be stacked one upon the other with ease.

One of the types which has come into favor recently is the open front stacking box, such as is shown in the accompanying illustration. Provided with a special rim formed around the top, these units can be stacked to the ceiling without danger of tumbling. Aside from this stacking feature, the boxes serve as convenient and flexible storage or handling units on production lines. Parts in process may be carried along the line in units. By stacking, more work can be kept ahead of machine operators, thereby reducing handling time by truck.



—All-Steel-Equip Co., Aurora, Ill.

*It is estimated that 30,000 tons of steel sheets are used annually in the fabrication of stacking boxes used in the handling and storing of small parts in manufacturing plants*

**Open Front Facilities Storage**

The open front makes the unit usable for parts storage in stockrooms, as the boxes may be stacked shoulder high along one side of a room, or stacked back-to-back down the center to form a flexible shelving. This open front feature eliminates inventory count and simplifies stock keeping.

In assembly work, the stacking boxes may be placed in front of bench workers, several units high. Bench space thus saved is considerable. Workers may reach parts easier from these open front bins and thus reduce time in certain operations.

For layout in toolmaking, jig, fixture and die parts may be stored in units easily reached by toolmakers. Job numbers may be placed in card holders on the sides of the boxes.

Although these boxes are made and carried in stock in several sizes, it is found that the largest volume of production is in special boxes manufactured to the specifications of the users. The purchaser thus obtains boxes which are best suited to his individual requirements.

Boxes are fabricated from steel sheets ranging in thickness from 12 gage to 24-gage, depending upon the weight of parts to be handled in the boxes. The thickness of the steel, of course, determines the stiffness of the box. Naturally, a box designed to hold truck pinion gears would lose its shape quickly if fabricated from 24-gage stock. The manner in which the boxes are formed, assembled and welded together provides edges and corners which are well reinforced and stiffened.

For the most part, these boxes are supplied with an unfinished steel surface, although all welds and burrs are carefully sanded down to present smooth surfaces. For jobs where corrosion is likely to occur, the boxes are made from galvanized sheets; in other cases where the units will not be subject to hard use, the boxes are finished in black or olive green enamel.

It is estimated that approximately 30,000 tons of steel is consumed annually in the manufacture of boxes by the nine or more companies making this product.

## Developing Alloy Steels For High-Pressure Boilers

(*Concluded from Page* 33)

of wisely selected alloys. Due regard must be given, first of all, to well and carefully made steel, for just the addition of certain metals will not overcome poor melting practice. Extra care and close observation with technical control are most essential today to provide better and higher quality steel for fabrication and construction.

The selection of base material of the proper quality must be given thought. Today, the industry is more seriously than ever before "use-minded." Consequently, the opinions of fabricators and inspection groups are welcomed and encouraged in order to guide development.

## Announces New Covering For Plating Racks

A noncontaminating, corrosion-resisting-coating for plating racks has been announced by the Hanson-Van Winkle-Munning Co., Matawan, N. J. Known as Kote-Rax, and applied by dipping, the coating covers the rack with a tough, rubber-like film possessing high dielectric resistance and capable of withstanding considerable mechanical abuse.

Extensive tests are said to have indicated that the coating is not affected by immersion in the common solutions used in the following plating baths: Chrome, nickel, cadmium, zinc, copper, brass, silver, tin, etc. The coating also withstands the action of solutions encountered in connection with the foregoing plating operations. Racks protected by the coating have been used as long as two months without showing signs of deterioration, it is stated. Old racks as well as new can be treated satisfactorily.

The coating must be heated for use in nonmetallic tanks. The average application consists of four dips at 230 to 260 degrees Fahr. It does not adhere to the metal but holds its position by shrinkage.

According to the company's announcement, a complete coating service is available for the larger plating shops. Job platers in strategic cities will be equipped to coat racks for consumers who do not have a sufficient number to warrant installation of rack coating equipment.

*Welded stainless steel containers used in the food industry*

# Stainless Steel Containers Fabricated by Welding

SINCE the discovery of the stainless steels the problem of obtaining a suitable material for containers of a large number of types, for both ordinary and special uses, has been solved. The fabrication of containers was one of the first, and is now one of the largest, uses for stainless steel according to *Oxy-Acetylene Tips* from which this article is abstracted. It has many advantages in this particular application, among them being strength, lightness, durability, corrosion resistance and beauty. It is much stronger than ordinary steel and thinner sections may be used in making containers of this metal without a sacrifice of strength. Because of its corrosion resistance, there is no necessity of making allowance for rusting and corroding by providing heavier sections.

### Does Not Impair Contents

Stainless steel is resistant to corrosion from many corrosive chemicals and it resists attack from fruit acids and the ordinary organic acids. A particular advantage of this metal when used in containers for beverages is the fact that it imparts absolutely no taste to the beverage. Tests on beer, milk, wine, fruit syrups and other liquids have demonstrated this fact repeatedly and also have shown that no pitching or other surface coating is needed.

Stainless steels can be fabricated readily by oxyacetylene welding. This is in itself an important factor in adding strength, permanence, and neat appearance to the finished containers. Factors affecting the correct procedure for oxyacetylene welding stainless steels are the high chromium and nickel contents and the higher coefficient of expansion as compared with ordinary steels. Because of the high chromium content of the stainless metal it is necessary that a neutral welding flame be used. If the flame has an excess of acetylene, chromium carbide forms which produces brittle welds and reduces the resistance to corrosion. An oxidizing flame accelerates oxidation of the molten metal and results in an unsound weld. The 18-8 type stainless steel may be brought to a welding temperature more readily than mild steel, because of its lower thermal conductivity, as the base metal will not carry away the heat so rapidly. Consequently, a smaller size welding head or tip must be used on this type of steel. The flame should not be any larger than that necessary to do the job. During welding the flame is kept pointed ahead of the weld so as to preheat the seam. The welding rod should be of the same analysis as the steel being welded. The use of flux helps to protect the back of the weld where the flame cannot protect it, and for stainless steel, a flux especially designed for welding high chromium steel, known as Cromaloy flux, has been used with great success. It has high solvent power for chromium oxide and is of suitable viscosity at the welding temperature. It is best used by preparing a water paste and painting both the under and top side of the plate edges to be welded. This procedure facilitates excellent weld penetration.

*Welded container used for handling chemicals in a dyeing plant*

Too great emphasis cannot be placed on the proper design of jigs, if used, and also the design of parts to be welded. It must be remembered that stainless steels have a higher coefficient of expansion than ordinary steels and that in most cases this difference in expansion must be taken into account when preparing the work for welding. In light work the expansion can be resisted completely by permitting the metal in the work to take up the resulting strains. In heavier work it is usually best to have jigs so designed as to carry away the right amount of heat so there will not be any noticeable effect in the work itself, or to control the welding operation carefully so that a minimum of heat will be allowed to pass into the work. In many cases it is advisable to anneal the welded job after it is completed.

### Technique of Welding

The containers with a spout, shown in one of the accompanying illustrations, are designed for handling chemicals used in a dyeing plant. These containers are 18 inches deep and 10 inches diameter, and are made of 22-gage stainless steel. They are welded by the oxyacetylene process. The edges on the longitudinal seams and on the bottom are flanged for welding. The spout, which is large, is welded on the inside of the containers. These containers are welded without the aid of any type of jig, and, due to proper design for welding, there is little, if any, warping. Besides being used for chemicals in the dyeing industry, stainless steel containers also are being used to a great extent in practically all the food industries, for mayonnaise containers, breakfast food mixers, canning equipment and hundreds of other similar applications. Other uses are for beer, milk, meat products, tooth paste, shaving cream, soap and a large variety of chemical products. In many of these uses, one of the important factors in using stainless steel has been the beauty of the steel itself. The brilliant luster of stainless steel has a definite sales appeal, and in products where sanitation is stressed or where appearance is an important selling point, stainless steel is finding increasing applications.

# *Thank You... California Tech*

**FOR YOUR SELECTION OF SKF BEARINGS FOR THE LONG GRIND OF THE NEW 200-INCH TELESCOPE MIRROR!**

*Two giant SKF Bearings, produced for California Institute of Technology to be used on the grinding table on which the 200-inch mirror is to go through the five-year finishing process. They are the most accurate giant anti-friction bearings ever produced. BELOW: The giant mirror after casting by Corning Glass Works, Corning, N.Y.*

1420

● You are planning, California Tech, the longest grind in the world . . . a five-year job of grinding the famous 200-inch telescope mirror now cooling at Corning, N.Y., to a new high in accuracy. It will be within one millionth of an inch from the true!

Lay minds are staggered by mammoth mechanical or astronomical things that are so uncannily close to perfection. But to SKF men all over the world, trained to thinking in terms of precision manufacturing, news of your selection of SKF Bearings for this delicate grinding operation brought a definite feeling of pride.

Let us tell you about the two giant SKF Bearings that have been delivered to you. They are almost as tall as a man. They are the world's closest twins. The difference in the diameters of the two bearings is exactly three ten thousandths of an inch. The roundness of the bearings is within half a human hair's breadth of sheer perfection.

Nowhere else on earth . . . and quite likely nowhere on the millions of planets that will be scanned through the great telescope, will giant anti-friction bearings be found that are comparable in accuracy with these.

SKF

**BALL & ROLLER BEARINGS**

SKF Puts the Right Bearing in the Right Place

SKF Industries Inc., Front Street and Erie Avenue, Philadelphia, Pa.

# METHODS AND MATERIALS

## Requisites for Safety in Power Press Departments

To make a power press room efficient and safe, it is advisable to remove all, or nearly all, overhead belting and use either separate motors or a clutch on each machine, as the static from the belting will blacken the ceiling in a short time. This is the recommendation of C. Bornmann, Agfa Ansco Corp., Binghamton, N. Y., appearing in a recent issue of *Power Press Safety* published by the power press section of the National Safety council, Chicago.

The room should be painted white, down to about 3 feet from the floor, and this lower part should be painted gray. Enough inverted lights should be placed on the ceiling to give a good illumination over the room. A 40-watt lamp must be placed on each press; this will give the room a cheerful appearance which has a great effect for efficiency on operators.

**Paint Presses Every Year**

Each press should be painted with a light gray enamel at least once a year, says Mr. Bornmann. White lines should be painted on the floor for gangways and no one should be allowed to place anything between these lines — this to prevent accidents. The floor must be swept daily and given a thorough cleaning once a week.

All presses, particularly old ones, must be checked regularly to make sure that they will not trip accidentally. All dies must be so made that it is unnecessary for the operator to have his hands under the press when the press is released. All flywheels or other points of danger must be guarded properly.

There are many different kinds of guards for the operator. Mr. Bornmann has found some perfectly safe, providing, of course, that they are kept in proper working order. Special large presses require specially-designed guards according to the work.

$ $ $

## Cost of Sewing Machine Parts Reduced by Grinding

In endeavoring to reduce costs, a sewing machine manufacturer found that internal grinding would offer a considerable saving and enable him to hold his limits of accuracy more consistently and to save money because of reduced scrap. This manufacturer had done little grinding and had not appreciated what the modern automatic internal grinder would do for him. Careful study revealed that he had a large number of different parts which could be ground and automatic sizing could be used to advantage on all but one.

At the outset, the manufacturer felt that the nonautomatic type of grinder would be desirable because of the variety of work, but demonstration of a chucking type of automatic internal grinder, arranged so that it can be used also as a plain machine, without the automatic features, proved conclu-

## Many Operations in One Set-Up

*THIRTEEN DISTINCT MACHINING OPERATIONS are performed on this setup on a vertical turret lathe in the East Pittsburgh, Pa., shops of Westinghouse Electric & Mfg. Co. Machined to a tolerance of 0.001-inch, this commutator bushing is part of the motive power on one of the 4620-horsepower streamline locomotives built for the Pennsylvania railroad. In addition to the machining operations, the bushing is also polished on this lathe*

sively that this type of machine was the one for him to use if he was to obtain the desired accuracy consistently with a minimum of scrap and lowest cost.

With two fixtures, so equipped that by merely changing clamps, jaws and locating members, a wide variety of irregular shaped blocks, links and connections, cams, cam rolls, carrier parts, feed gears and levers can be handled profitably. The equipment was installed for a few of the larger quantity parts and the basic fixtures arranged for later adapting to the other parts. In this way, the user obtained immediate savings with a small amount of fixture equipment, and the balance of the fixture equipment will be purchased gradually

S S S

## Nickel-Copper Condenser Tubes Have Long Life

Most of the nickel-copper alloys exhibit excellent resistance to corrosion by sea water. This characteristic, in association with the ease and economy of their fabrication, has within recent years led to adoption of the 20-30 per cent nickel-copper alloys for condenser tubes for marine power installations, both in merchant marine service and in many of the principal navies.

These alloys are substantialy free from the troublesome pitting and perforation often encountered with other tube materials and experience has shown that nickel-copper tube condensers may be maintained economically in service over long periods during which frequent replacement of the other materials (admiralty metal) would be required.

S S S

## Develops New Method for Casting Centrifugally

Control of the metal stream in a recently patented vertical-type, centrifugal molding process is accomplished by use of a conical pouring cup, speed of rotation, and mounting the pouring ladle off center. That arrangement gives a whirling action to the metal in the pouring cup, distributing it in a circular stream in the mold wall so that it will strike the mold wall at any desired point. In that way, the metal stream will not impinge on a central core which may be used.

S S S

## Barium Peroxide Used To Oxidize Tin from Copper

In cases where one metal becomes contaminated with small amounts of another, the contamination can be removed by oxidation if the proper agents are used. This is shown in a recent patent in which moistened barium peroxide in briquet form is employed to oxidize tin from an alloy of 99 per cent copper and 1 per cent tin. The tin oxidizes more rapidly than the copper, and the oxides formed combine with the barium oxide and hydroxide as fusible compounds which are said to be easily fluxed off.

S S S

## Melting Costs for Rotary Powdered Coal Furnace

With the Brackelsberg, rotary powdered coal type furnace, the temperature of the metal is 2850 degrees Fahr. With air preheated from 500 to 1000 degrees, any practical melting temperature can be attained. On gray iron melting, the cost of pulverized coal is approximately 85 cents per ton of iron melted. Power cost is from 10 to 25 cents per ton, depending upon the size of furnace and the local current rates. Refractory cost is said to be 35 to 40 cents a ton.

S S S

## Molybdenum in 18-8 Steel

Molybdenum in amounts from 2 to 4 per cent added to 18-8 stainless steel is said to enhance general corrosion resistance against many chemicals, raise the strength at elevated temperatures and provide a strong inhibitor against intergranular attack when used in a properly balanced analysis.

# Asphalt Pipe Coating Tanks Heated by Tubular Electric Immersion Units

LARGE diameter steel pipe used for water mains, culverts and similar applications, is subject to electrolysis and the oxidizing action of earth moisture and the elements; therefore, it is customary to protect the surfaces of the fabricated pipe with a coating of hot asphalt. To comply with the specifications for this type of coating, the pipe sections are lowered vertically into large floor-level tanks containing the liquid asphalt. These tanks must be heated to maintain the coating material at the proper temperature.

Because of the large amount of coating material involved—one tank may contain as much as 20,000 to 25,000 gallons, because of the low heat conductivity of the material, and finally because the most desirable coating temperature is close to the flashing point of the material, the maintenance of a uniform temperature offers considerable difficulties. Heating the tanks directly with coal or oil, permitting the flame to strike the tanks, is unsatisfactory for

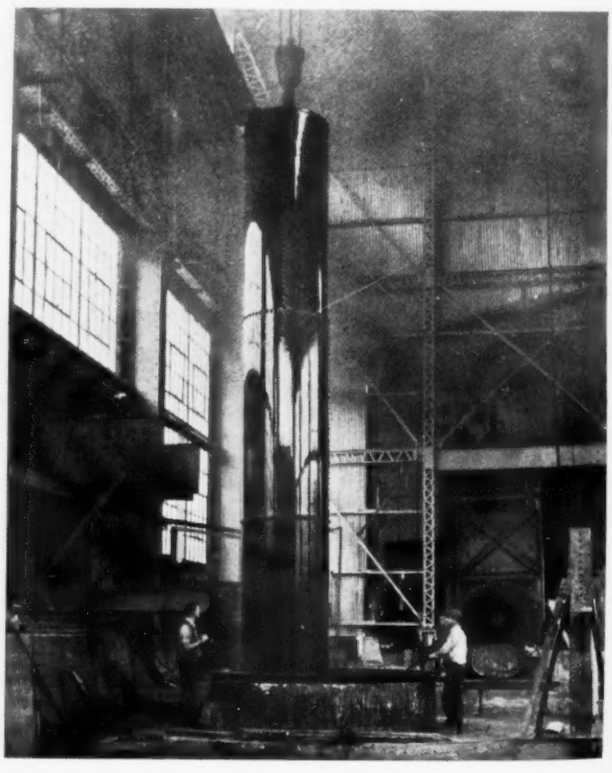


*FIG. 1—Removing a steel pipe culvert from an asphalt coating tank. This tank is heated with a tubular electric immersion heater*

# PARTS LIKE THESE

## CAN BE CARBURIZED AND QUENCHED FROM THE POT WITHOUT DISTORTION

In the production of transmission and differential gears, pinions, suspension parts, king pins and other carburized or oil hardened parts, Republic's Improved S.A.E. 3100 Steels offer the twin advantages of improved performance and lower costs. » » » Parts made from these fine-grained 3100 Steels can be carburized and quenched from the pot without distortion. They develop a tough core and a good case. Readily conditioned for machining, Republic's Improved 3100 Steels are rapidly replacing many higher priced alloys. » » » Republic Metallurgists will be glad to answer questions concerning this improved series of S.A.E. 3100 Steels. » » »

# Republic Steel CORPORATION

CENTRAL ALLOY DIVISION, MASSILLON, OHIO
GENERAL OFFICES: YOUNGSTOWN, OHIO

it does not promote uniform temperature. Where the flame touches the tank, the temperature is high causing the asphalt to break up; at other points the temperature is too low and the coating material is not sufficiently thin for satisfactory application.

Since good results can be obtained only by transferring the heat from a uniformly heated body with a large surface in contact with the asphalt, H. O. Swoboda Inc., Pittsburgh, has developed tubular electric immersion heaters for coating tanks. These heaters consist of common bare steel pipes arranged in units and mounted on a supporting shell by means of insulating supports. The entire equipment forms one compact unit which is lowered into the tank and it can be lifted out for inspection at any time by merely disconnecting the electric feeders from the terminals.

**Heat Coating Material at Night Only**

Contrary to customary practice, ordinary steel pipe was selected for these electric heaters, as it offered decided advantages. It is claimed that the pipe heater cannot burn out and it does not require repairs. Because of the large contact surface of the pipe with asphalt or other material and the fact that the heaters are designed for operating as a very low watt density—less than 1 watt per square inch, a uniform temperature can be maintained throughout the large mass of material. In addition, coking or carbonization of the most sensitive coating materials is said to be completely eliminated.

In view of the fact that the heater is in direct contact with the material, all of the heat generated is transferred directly into the material without conducting the heat through any other surfaces. In the case of a vertical coating tank, such as shown in Fig. 1, a pit of the proper depth to receive the tank has to be provided. To reduce radiation losses to a minimum, heat insulation is placed around the tank wall and bottom. An insulated lid can be provided on the top of the tank to retain the heat when no coating is being done.

As can be observed from Figs. 2 and 3, the vertical heaters are made up in three sections, each independently controlled and separately operated. By means of control thermometers, the temperatures can be maintained automatically at any predetermined degree of heat.

In the interest of keeping operating costs at a minimum, especially in eliminating excessive demand charges, it has been found practical to heat the coating material over night only, using the same demand which during the day is required by motors and other equipment in the shop. The temperature in the tank during the day time does not drop sufficiently without current on to affect the quality of the coating.

## Tentative Standards for Piping Made Standard

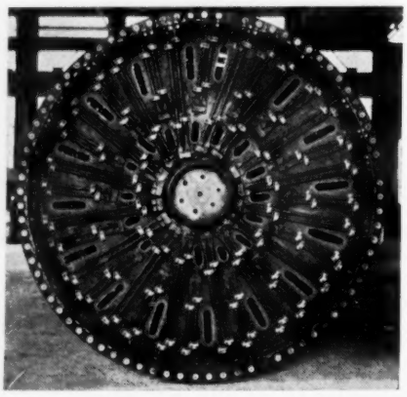
A year ago, nine standards and tentative standards for pipe and tubing of the American Society for Testing Materials were approved with the same status by the American Standards association. In accordance with recommendations of the sectional committee for this project, B36, three of these specifications, which were advanced to the status of A.S.T.M. standard in 1934, have now been advanced by the American Standards association from American tentative standard to American standard.

Specifications advanced to American standard are:

Specifications for Electric Resistance Welded Steel Pipe (B36.5-1935). This standard covers two grades of pipe up to and including 30 inches diameter for conveying liquids, gas, or vapors at temperature below 450 degrees Fahr. and is adapted for flanging and bending in smaller sizes. The code for pressure piping allows the use of this pipe in power piping systems of from 250 to 400 pounds per square inch, and in gas and air piping systems, and direct heating systems.

Specifications for Lock-Bar Steel Pipe (B36.7-1935). These specifications are for pipe suitable for liquids or gases. This pipe is made from steel plates rolled or formed into a circle, having longitudinal edges planed and upset to a dovetail form which engages in the grooves of an H-shape steel lock bar to form the longitudinal joint of the pipe. The code for pressure piping allows its use in gas and air piping systems.

Specifications for Riveted Steel and Wrought Iron Pipe (B36.8-1935). These cover shop fabricated straight pipe suitable for conveying liquids or gases. The pipe is made from steel or wrought iron plates with riveted seams. The code allows its use in power piping systems, gas and air piping systems, and district heating systems.



## Heat Treatment Lectures During Metal Congress

A series of five daily lectures on "Heat Treatment of Steel" will be presented by Dr. Marcus A. Grossmann, director of research, Illinois

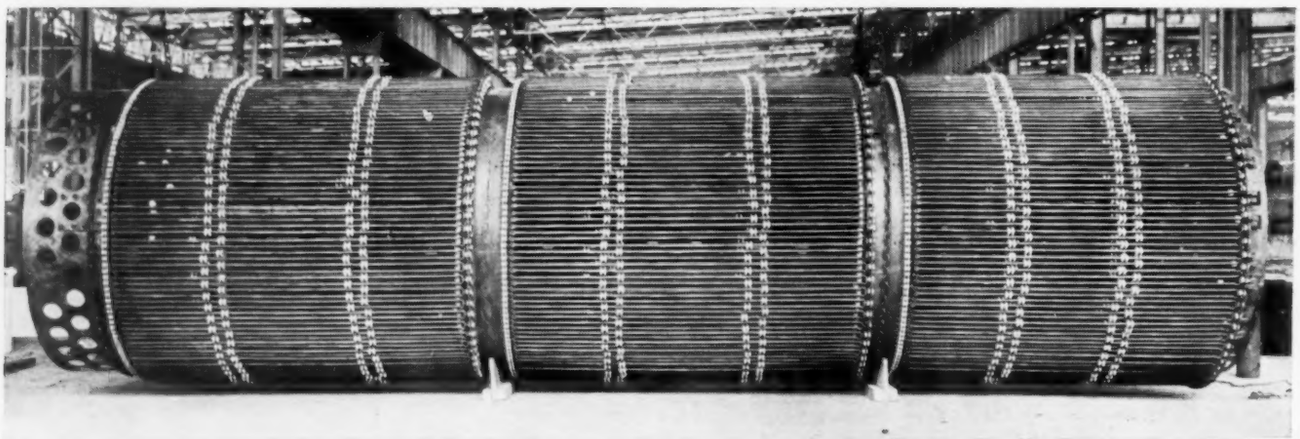


*Fig. 2 (bottom)—This tubular electric immersion heater for the vertical asphalt pipe coating tank shown in Fig. 1 is 35 feet long and 9 feet in diameter. It is mounted on a supporting shell for lowering into the tank. Fig. 3 (top)—Bottom view of the same heater, indicating the manner in which the tubular units are mounted on the bottom supporting shell*

Steel Co., Chicago, at the seventeenth annual National Metal congress and exposition to be held in Chicago, Sept. 30-Oct. 4. These lectures will be given each afternoon in the new International Amphitheatre.

In announcing these lectures, W. H. Eisenman, secretary of the American Society for Metals and managing director of the exposition, states that Dr. Grossman has succeeded in reducing a very complex subject to its most simple terms. Although the lectures will interest the technical man, they will be especially interesting to the practical man who wants a simple, straight-forward explanation of the heat treatment of steel.

Dr. Grossmann is the author of numerous technical papers on the properties of special steels and tool steels and co-author with E. C. Bain of a book on high speed steel. He was Campbell memorial lecturer of the American Society for Metals at its 1930 congress in Chicago.

## Nickel and Chromium Raise Hardness of Cast Iron

When 4 or 5 per cent of nickel together with from 1 to 1.5 per cent of chromium are added to plain chillable or white iron, the structure is rendered martensitic and its hardness is increased very substantially—from about 450 brinell to about 600-700 brinell. The resulting martensitic white iron has a quite extraordinary degree of abrasion resistance and is beginning to be widely used for the wearing parts of crushing and grinding machinery and for mill rolls for the rolling of steel and other metals.

These martensitic irons often outlast plain iron from five to six times in crushing and grinding service. They are in some cases even substituted for steel although, of course, they are not as ductile and tough.

## Develops New Products

Due to more exacting state requirements for the adequate illumination of trucks, buses and other large bodied vehicles, in order to make highways safer for night driving, the K-D Lamp Co., Cincinnati, has developed two new products. One is a heavy duty clearance lamp made as a heavy, zinc-base, die casting with the lens recessed below the surface of the outer rim, thus preventing breakage of the lens when the truck on which the lamp is mounted backs into a loading platform. The other is a reflector of the type required in many states in lieu of clearance lamps; it is a round steel stamping with a solid piece of special light transmission glass, in red, amber, green or crystal shades.

# WELDING, et cetera . . .

BY ROBERT E. KINKEAD

*IN THIS column, the author, well-known consulting engineer in welding, is given wide latitude in presenting his views. They do not necessarily coincide with those of the editors of* STEEL.

## Seven Years of Life

HOW to reduce costs in a welding department where "every job is different" is not as difficult a problem as it appears to the unitiated. The job is to find a measurable factor which is common to all the "different" kinds of work. Productive effort is what the operator sells and management buys. Achievement, in terms of quantity of production, depends on how effectively this productive effort is used. Incentives are more effective in getting results than excessive supervision.

In all types of electric welding, the time the operator actually spends welding is readily measured with high degree of accuracy. This is productive effort. Set-up and preparations for welding represent productive effort but are not so easily measured directly although it is being done effectively. The basis of all successful cost reduction methods is accurate measurement of the variables and the more variables measured, the better the results.

The first step in cost reduction is to measure the variables accurately and publish the results to the personnel involved. The next step is to offer an incentive for better achievement. Manufacturers who believe that cost reduction methods cost too much and are too much trouble to carry out day in and day out, year after year, are rapidly disappearing. Seven years in the manufacturing business is the average business life of companies which do not follow a consistent cost reduction policy.

## High Rate of Travel

A classic argument among welding men is developed over the question of which produces the most warping —a small welding rod and low current or a large welding rod and a high current. Cases are usually cited of large welding rod and hign currents producing the least deformation. Deformation is produced by putting heat into the pieces being joined by the weld. In general, the more heat put in, the more deformation. Using a high current and a large welding rod, together with a high rate of travel, may result in putting less heat into the metal and therefore, less deformation. High heat and rate of travel are always advantages. The correct heat is all the heat the job will stand.

## Sparks and Flashes

Hydromatic welding is electric spot welding in which a considerable number of spot welds are made in rapid succession by hydraulically driven electrodes. This reduces the demand charge for electric power, eliminates interference between currents in separate spots, permits efficient set-up to make a large number of spot welds without changing the fixture.

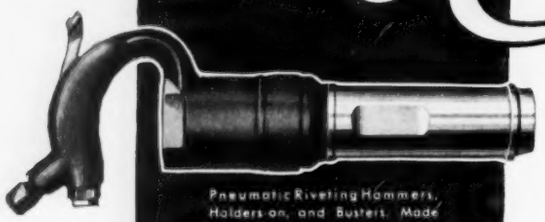
* * *

Many manufacturers have learned too late that welded assemblies, under certain circumstances, are patentable. One company built a motor frame of welded steel only to find that another manufacturer had a patent on that design. Rather than lose face by paying royalty to a competitor the company is building to a design that costs more and is less desirable.

* * *

Torch hardening of the face of gear teeth is known to be technically sound practice from service records of thousands of treated gears. Yet, no very satisfactory theory has been advanced which explains both damaging residual stresses in welds and torch hardening of gear tooth faces which does not set up damaging stresses.

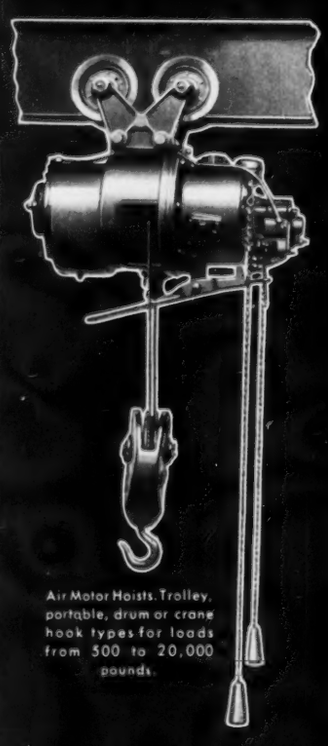
# Save . . on Air Consumption . . on Lowered Cost of Maintenance . . by Increased Production



Pneumatic Riveting Hammers, Holders-on, and Busters. Made for various size rivets, light and heavy work.

Pneumatic Scaling and Chipping Hammers. Made in a range of sizes, weights, and powers, for light and heavy chipping, calking etc.

Pneumatic Grinders. For various speeds and types of service grinding, surfacing, wire brushing, etc.



Air Motor Hoists. Trolley, portable, drum or crane hook types for loads from 500 to 20,000 pounds.

The savings possible today with improved I-R pneumatic tools may make general replacements advisable in your plant.

Through the savings on air consumption, maintenance and increased output the entire cost of replacement may easily be covered in a few months.

Schedules are being stepped up today—yesterday's equipment is costing you money every hour it operates.

Ingersoll-Rand will help to analyze your air conditions—no obligation—and it is the one best way to learn exactly how you stand on air equipment.

# Ingersoll-Rand Pneumatic Tools

INGERSOLL-RAND COMPANY

11 BROADWAY, NEW YORK, N. Y.

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| Birmingham | Cleveland | Tulsa | New York | San Francisco |
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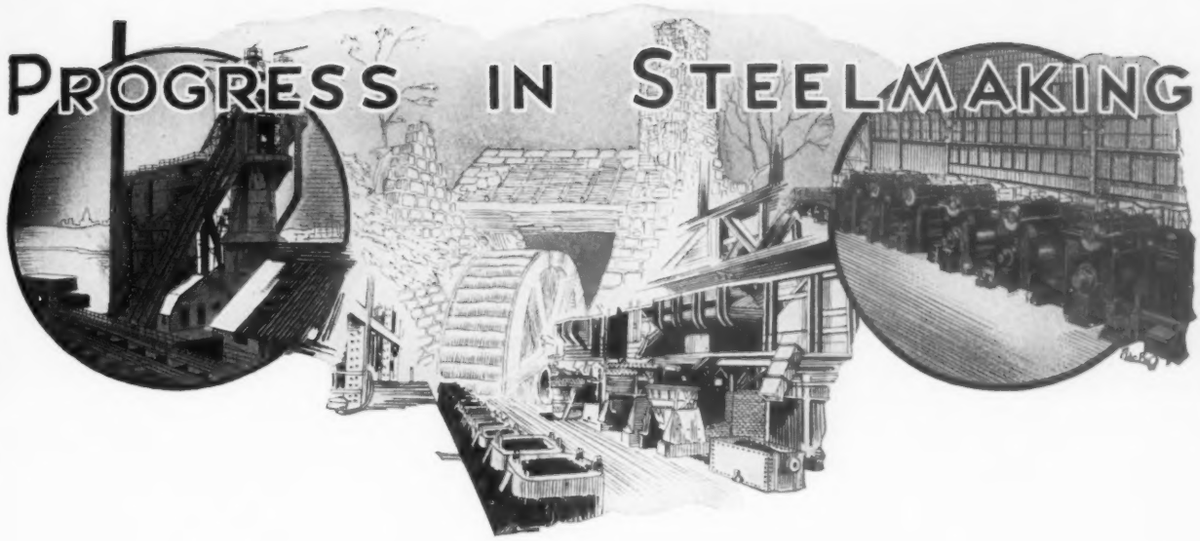
| Chicago | Duluth | Newark | Salt Lake City | Washington |
| | | New Orleans | | |

180-B




## Lowers Maintenance Costs

Wear of brasses on overhead traveling cranes serving an open-hearth shop in the Pittsburgh district was solved in a novel manner. Enclosing the bearings offered little protection against the action of iron oxide particles. The forged steel axles and bearings of the driving track wheels were replaced with nitrided steel axles and new brasses. Inspection of the nitrided pin after several months operation disclosed a high polish and practically no wear, nor were the brasses worn to any extent. Maintenance costs were curtailed greatly as a result of this replacement. Moreover, the high polish acquired by the axles was instrumental in reducing the friction considerably. Equipping four of the eight axles of one crane with nitrided steel increased the speed 16 per cent and effected in savings in power of 36 per cent.

◆ ◆ ◆

## Handles Annealing Boxes

Raising and lowering large annealing boxes, which weigh about 60 tons each, and depositing them in the annealing furnace or on storage racks without the use of trucks now can be accomplished by the use of a new type transfer car.

◆ ◆ ◆

## Cement Is Nonshrinkable

High temperature fire cement, which is claimed to withstand temperatures up to 3300 degrees Fahr., starts to vitrify at 1800 degrees Fahr., and does not shrink or crack when fluxed with hot brick, now is being marketed. It is recommended for laying up brickwork, patches and repairs and as a wash for various types of industrial heating furnaces, ladles and ingot molds. The material is applicable to oil, open-flame gas, electric and fuel-fired heating furnaces.

◆ ◆ ◆

## Fit Secured by Grinding

Where a slight imperfection prevents a proper fit of the nozzle cup with the stopper head in steelworks ladles, satisfactory results can be obtained by grinding the nozzle cup. In performing this operation at one plant care is taken not to grind the surface too deeply in order not to expose the soft interior beyond which surface firing has toughened the refractory.

◆ ◆ ◆

## Operates Large Press

A 7000-ton press, said to be the largest of its kind in the world to be operated by a high-pressure electrohydraulic pumping set, recently was installed at a plant in Sheffield, England. A penetration speed of 2 inches per second is attained. Ten 5-inch penetraton strokes are given a minute at full load.

## Mechanical Scale Speeds Weighing

*WEIGHING OUT LOADS OF GRANULATED SLAG at the plant of the Great Lakes Steel Corp., Detroit, is accomplished on a mechanical weigh recording auto truck dial scale. The empty truck drives on to the scale platform, the exact weight being indicated immediately on the dial. The weighmaster then inserts a card in a slot in the recording mechanism and pushes a button. The weight is printed on the card and the truck drives off, the whole operation taking only a few seconds. After the truck has been loaded it again is driven on to the platform. The card showing its tare weight again is inserted and the gross load is printed. Subtraction of the one item from the other gives only the net load of the slag without any possibility of error. The scale, which was built by Fairbanks, Morse & Co., Chicago, affords the handling of a large amount of traffic without overtaxing the capacity of either the equipment or the weighmaster*

# IMPROVING OPEN-HEARTH FURNACE DESIGN

by William C. Buell Jr.

Chapter IV — Part II

## Typical Regenerator Chambers

BEST value on which to quickly judge the merits of regenerator operation will be the representative average temperature of the voiding furnace gases at $A_{12}$, the regenerator outlets.

Experience has shown that with producer gas operation the economical minimum temperature should be about 1250 degrees Fahr.; with mixed gas firing, below 1000 degrees Fahr.; and with oil or tar operation, about 1100 degrees Fahr. Among the group A furnaces the outlet temperature of furnaces K and J is around 1300 degrees Fahr. and that of all others is much higher. The conclusion may be safely drawn, therefore, that the combined factor with producer gas should be at least 40.0 and likely approaching 45.0 if the greatest attainable fuel economy is to be secured, with about 75 per cent of the total represented in the air chamber.

### Combined Factor Used

The regenerator outlet temperatures of furnace G is about 1000 degrees Fahr., and of furnace L 850 degrees Fahr., which premises a combined factor of possibly 50.0 as desirable for mixed gas firing. In preheated mixed gas practice about two-thirds of the total volume should be found in the air chamber. The increase of regenerator size beyond this figure as in furnace L to develop the extremely low outlet temperature actually found in operation probably cannot be justified from an economic standpoint.

Among the furnaces fired with fixed fuels, the following regenerator outlet temperatures have been reported: Furnace I, 1200 degrees; E, 1200 degrees; and F, 1000 degrees Fahr. All other furnaces show much higher temperatures. From this the conclusion may be drawn that the combined factor should be at least 50.0, which, in view of the smaller volume of the products of combustion from fixed fuel firing, allows the use of a smaller regenerative system than for producer or mixed gas firing, providing there is an equal heat release from the fuel per unit time.

The foregoing values are set up in this manner to be used merely as a basis for preliminary regenerator design inasmuch as several arrangements of checkers are possible in the same volume that may modify results considerably. The correct arrangement of checkers is the subject of a following chapter.

The rider system is the subsystem which supports the checkerwork and forms the underflues. As before mentioned, it consists of rider walls, generally rider arches, and rider tile, the latter being so spaced as to directly support the lower course of checker brick.

### Requirements of Rider Walls

Rider walls are brick walls laid on the regenerator bottom and extended from end to end of the chamber. Their height is sufficient to allow the free passage of the gaseous fluids flowing either in or out. In addition, they should be of sufficient added height beyond the requirements of fluid flow to allow for the accumulation of a large portion of the gas-borne dust or other solid matter that will be deposited during a normal campaign without encroaching on the volume required for free gas flow. As shown in Table XCI and even with excellent design and operation the quantity of dust may be considerable, and if not provided for will cause a slowing of operation later in the campaign. The deposit is largely a ferric oxide and where sintering facilities are at hand the deposit should be returned to the blast furnace and an appropriate credit rendered to the open-hearth operation.

The spacing and thickness of the rider walls depend on the method of spanning them for the checker brick or rider tile support. If the walls are spaced closely and spanned at right angles by the rider tile placed directly atop the walls, there are generally four or five rider walls in the wider air chambers and two or three in the narrower gas chambers. The spacing will be that of tile of convenient length, 24 to 36 x 9 inches, or 12 to 15 x 3 or 4½ inches, being the usual sizes employed. With this arrangement the rider walls are usually 6¾ inches thick, but occasionally 9 inches thick. Such an arrangement is found in the regenerators of furnaces A, N, O, D and F.

A second arrangement consists of a series of rider walls usually three in the air chamber and one in the gas chamber, strengthened and spanned by a series of sprung rider arches. These arches are spaced so as to be spanned by rider tile of appropriate length placed parallel to the rider walls. The chief advantages of this type over all others lie in the fact that three 9-inch rider walls occupy less of the transverse area than five 6¾-inch rider walls by 6.75 square feet per foot of rider wall height. Rider tile of lesser length and consequently greater strength may be used, and with the interlocked rider tile design as illustrated in furnaces I, Fig. 135, and L, Fig. 136, a much more rugged and stable rider system is developed. However, the inclusion of the rider arches will develop a horizontal thrust at the side walls, which under some conditions may be considerable. The same general scheme less the interlocking action of the rider tile referred to in the foregoing regenerators is found in furnaces J, K, G, B, and E.

### Rider Arches Detailed

A series of half round rider arches extending across the regenerator bottom is illustrated in furnaces P, H and M. This type of construction may curtail severely the transverse area and is not recommended.

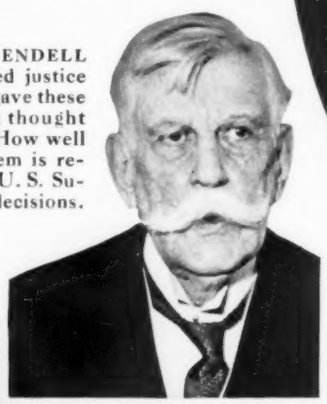
Openings through the rider walls, shown in regenerators I, L and H, are of great assistance in securing the best distribution of air or gases un-

# MAN SERVES BEST WHAT HE LOVES MOST

THOMAS A. EDISON loved invention. His genius and fertile mind have made history and changed every one's daily life.

LUTHER BURBANK loved plants. He taught them new ways to grow, thus producing improved and even new types.

OLIVER WENDELL HOLMES loved justice and law. He gave these interests his thought and energy. How well he served them is recorded in his U. S. Supreme Court decisions.



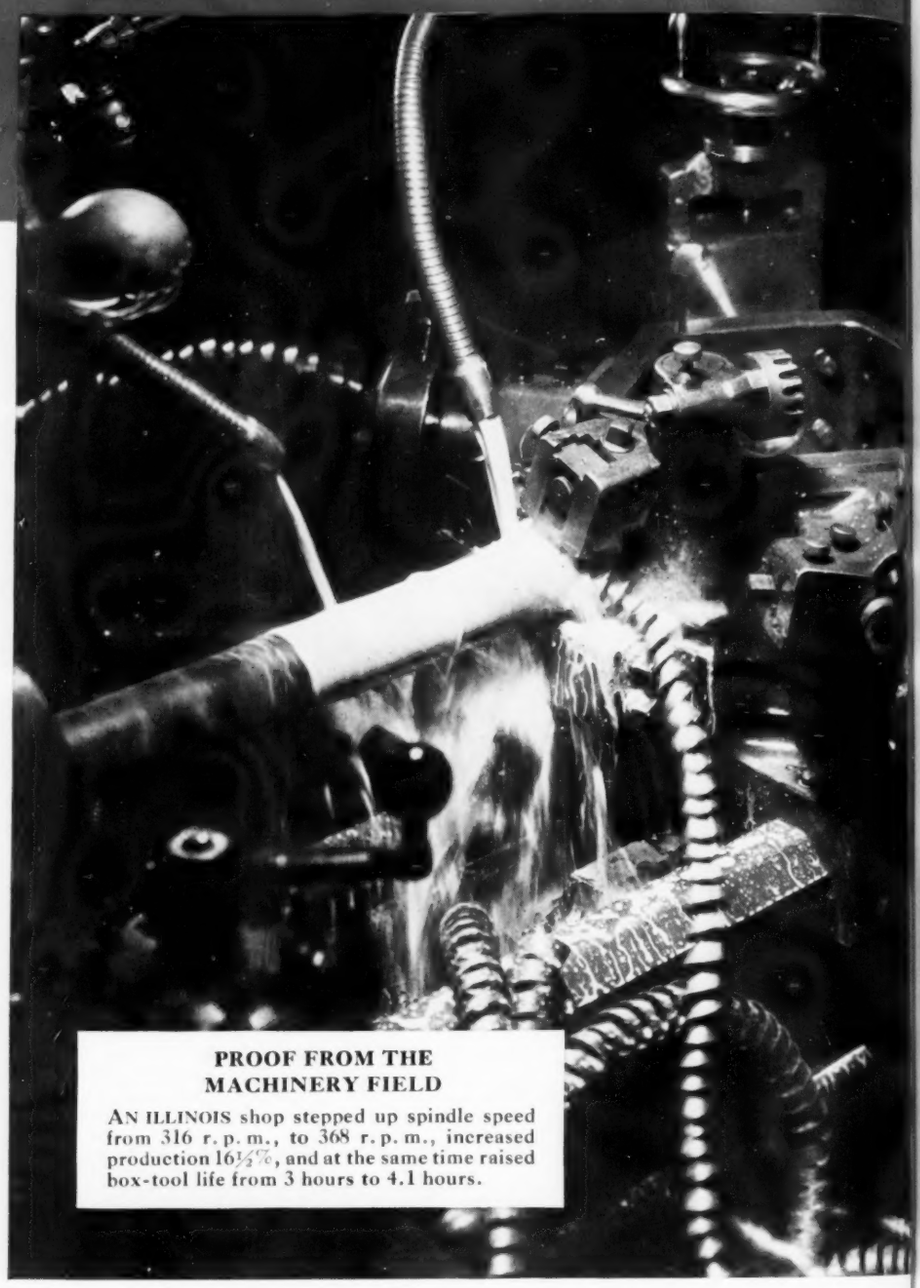
SIMILARLY some men love machines. They enjoy watching them work—like to keep them working well. Such men have had the cooperation of Socony-Vacuum for 69 years. Since the early days when Gargoyle Oil 600-W replaced tallow in steam engines . . since the time Gargoyle oils were provided for the first engines of Geo. Selden and Dr. Diesel, this Company has been a friend to men who love to see machines give their best.

EARL SANDE loves horses. Riding in a race, he becomes virtually part of his mount, sensing every whim and urging him to his best.

## To Collaborate Closely With Thousands of Men Who Love Machines Has Been, for 69 Years, the Privilege of the Makers of Gargoyle Lubricants.

# MACHINERY REPAYS MAN.

## *for the care he gives it*



HOW WELL machinery serves man depends upon the care he gives it. Lubricated poorly, it takes a toll in excessive lubricant, excessive repairs, in lost power, in costly shutdowns. But lubricated well, it serves him well.

Eliminating unsatisfactory lubrication has been the prime work of the makers of Gargoyle Lubricants for over 69 years. Men who love machines prefer these oils. And their machines repay them in what we call Lubrication Profit.

This profit comes in savings in power, savings in maintenance, savings in production time, savings in lubrication costs.

A Socony-Vacuum engineer will study your plant, your production, your problems. He has a wealth of experience and knowledge gained through close contact with equipment manufacturers. He can make recommendations which will give you a Lubrication Profit.

**THE SUM OF THESE 4 SAVINGS**

4

1. REDUCED POWER CONSUMPTION
2. MORE CONTINUOUS PRODUCTION
3. REDUCED MAINTENANCE
4. LOWER LUBRICATION COSTS

**= LUBRICATION PROFIT**

**PROOF FROM THE MACHINERY FIELD**

AN ILLINOIS shop stepped up spindle speed from 316 r. p. m., to 368 r. p. m., increased production 16½%, and at the same time raised box-tool life from 3 hours to 4.1 hours.

## SOCONY-VACUUM MARKETING POLICY

INDUSTRY almost always finds that the controlled use of high-grade Gargoyle Lubricants pays for itself many times over and that they actually cost less to use than ordinary lubricants. But for such equipment as does not justify the highest-grade lubricants, Socony-Vacuum engineers will recommend a lower-priced lubricant consistent with true economy. Socony-Vacuum with a complete line of products, can supply the lubricants best fitted for the individual lubricating job. This service is based upon world-wide experience and co-operation with the makers of equipment.

# SOCONY-VACUUM OIL CO.

INCORPORATED

STANDARD OIL OF NEW YORK DIVISION · WHITE STAR DIVISION · LUBRITE DIVISION · WHITE EAGLE DIVISION
WADHAMS OIL COMPANY · MAGNOLIA PETROLEUM COMPANY · GENERAL PETROLEUM CORPORATION OF CALIFORNIA

GARGOYLE Lubricants

Table CX

## Regenerator Roofs of Typical Furnaces Developing Correct Roof Thickness

| Furnace | Present Roof: Span, feet—inches a | Present Roof: Included angle, θ, degrees b | Present Roof: Thickness, inches c | *Min. required thickness, inches d |
|---|---|---|---|---|
| A | 12—6 | 80 | 12 | 15 |
| J | 17—0 | 101 | 13½ | 16 |
| K | ..... | .... | .... | .... |
| N and O | 13—6 | 80 | 12 | 15 |
| I | 16—0 | 77 | 12 | 16 |
| P | 14—10 | 69.5 | 13½ | 16 |
| G | 16—1 | 77 | 12 | 16 |
| L | 15—1½ | 90 | 13½ | 15 |
| B | 11—4 | 106 | 12 | 13½ |
| D | 13—10 | 85 | 13½ | 15 |
| G | 10—11 | 180 | 13½† | .... |
| H | 13—7½ | 81 | 12 | 15 |
| F | 15—11 | 73 | 12 | 16 |

*Developed from Fig. 132.
†This semicircular roof will be stable only if loaded.

der the checkers through the equalization of pressure.

The dimensions of the rider system will be premised on the free areas required for fluid at the desired velocity plus an allowance for dust accumulation. The required minimum areas will be established from the free areas of the regenerator outlets, which are the critical areas $A_{12}A$ and $A_{12}G$, or collectively $A_{12}$.

The principal refractory used in the construction of the regenerator chambers is best firebrick occasionally used alone, but generally in various combinations with other materials. On account of the many different thicknesses of the materials and differences of arrangements of materials as found in the typical furnaces, the discussion of these refractory designs will proceed along general rather than specific lines.

REGENERATOR ROOFS: The regenerator chambers of furnaces A, N, O, I, M, B, H and F have 12-inch roofs and those of furnaces J, G, P, D, L and E, 13½-inch roofs. The roofs of furnaces J, I, G, L, B, E, H, F and M are insulated and those of furnaces A, N, O and B have a covering of common brick.

If the several regenerator roofs of the wider span are ivestigated as to their static stability it will develop that none of them conform to the requirements of minimum thickness as determined by Trautwine's equation. The essential data in this respect is listed in Table CX. The values of column d are the least permissible thickness to assure the correct distribution of internal forces.

It must be evident, therefore, that uniformly heavier roofs should be used in the regenerators.

Another and self-evident reason for the inclusion of the heavier roof is the conservation of heat. It is utterly fallacious to conserve heat by heavier refractories through the slag pockets and fantails and then unduly dissipate it through a decreased thermal resistance in the regenerator roof, and later again attempt to conserve by heavy regenerator walls. Temperatures are still relatively high in the upper sections of the regenerator chambers and McLoughlin* has stated that 70 per cent of the total radiation losses from the regenerator chambers takes place above the checkers. It, therefore, appears that the current practice with regard to the thickness of regenerator roofs is in need of revision.

### Costs Are Tabulated

The unit costs of regenerator roofs of various thicknesses both of bare fire brick and insulated design are presented in Table CXI.

Class D insulation is taken in all cases to be of such thickness, column h, as to develop a thermal resistence R = 4.0.

Thermal effects in these several

*The Theory and Application of Regenerative Principles in the Steel Industry by T. J. McLoughlin. Proceedings American Iron and Steel institute, 1929.

Table CXI

## Unit Costs of Roofs of First-Quality Fire Brick

| Brick size, inches a | Equiv. 9-inch standard b | Extra cost for size, per cent c | Pieces per sq. ft. d | Cost per Ft.² of Roof: Brick e | Cost per Ft.² of Roof: Labor and extras f | Cost per Ft.² of Roof: Total g | Thickness insulation,* inches h | Cost insulation† i | Total cost insulated roof per ft.² j |
|---|---|---|---|---|---|---|---|---|---|
| 9 x 4½ x 2½ | 1.0 | 0 | 12.8 | 57.6c | 68.4c | $1.44 | 4.25 | 53c | $1.97 |
| 12 x 6 x 3 | 2.27 | 15 | 8.0 | 94.0 | 96.8 | 1.91 | 3.6 | 45 | 2.36 |
| 13½ x 6 x 3 | 2.56 | 8 | 8.0 | 99.0 | 109.4 | 2.08 | 3.35 | 42 | 2.50 |
| 15 x 6 x 3 | 2.84 | 30 | 8.0 | 133.0 | 121.4 | 2.54 | 3.2 | 40 | 2.94 |
| 16 x 6 x 3 | 3.03 | 30 | 8.0 | 141.9 | 129.5 | 2.71 | 3.0 | 38 | 3.09 |

*Thickness of class D insulation required to make R=4.0
†At $1.50 per cu. ft. Table X.

Table CXII

## Unit Thermal Effects in Regenerator Roofs[1]

| Roof thickness, inches a | Bare Roof: Thermal resistance R* b | Bare Roof: Temp. cooler surface $t_s$† deg. Fahr. c | Bare Roof: Emission B.t.u./ft.²/hr. W d | Roof Insulated to R=4.0: Interface temp. $t_i$, deg. Fahr. e | Roof Insulated to R=4.0: Temp. cooler surface $t_s$‡ deg. Fahr. f | Roof Insulated to R=4.0: Emission B.t.u./ft.²/hr. W g |
|---|---|---|---|---|---|---|
| 9 | 1.05 | 510 | 1784 | 1837 | 270 | 536 |
| 12 | 1.4 | 450 | 1390 | 1720 | 270 | 536 |
| 13½ | 1.6 | 425 | 1242 | 1620 | 270 | 536 |
| 15 | 1.72 | 410 | 1156 | 1540 | 270 | 536 |
| 16 | 1.86 | 396 | 1075 | 1490 | 270 | 536 |

[1] Temperature of hotter surface, $t_h$, assumed as 244 degrees Fahr.
*From Fig. 10.
†Solved by Fig. 21.
‡Solved by Fig. 22.

Table CXIII

## Life Economies of Regenerator Roofs

**(1740 sq. ft. of roofs at 10 years life)**

| Roof thickness, inches | Bare Roof Costs First a | Radiation b | Total c | Insulated Roof Costs First d | Radiation e | Total f |
|---|---|---|---|---|---|---|
| 9 | $2505 | $69,800 | $72,305 | $3425 | $20,980 | $24,405 |
| 12 | 3323 | 54,400 | 57,723 | 4105 | 20,980 | 25,085 |
| 13½ | 3618 | 48,600 | 52,218 | 4347 | 20,980 | 25,327 |
| 15 | 4420 | 45,450 | 49,870 | 5108 | 20,980 | 26,088 |
| 16 | 4710 | 42,100 | 46,810 | 5370 | 20,980 | 26,350 |

roofs have been calculated and are listed in Table CXII. The difference in the emission rates of the bare roofs, following closely the ratio of change of depth, column d, is considerable, but the reduction of the emission rate through the application of insulation in such thickness as to develop a thermal resistence of 4.0 is of considerable economic significance.

Insulated to this value, the interface temperatures of the first two items, column e, are probably too high for safety since under some operating conditions the temperature through the series may be increased considerably. However, the data of Table CX indicate a 13½-inch depth of brick as the minimum to be used. A correctly designed regenerator roof should be insulated to the extent tabulated.

Regenerator chambers, including the roofs have an indefinitely long life. Chambers 20 or more years old are not unusual. Repairs are made from time to time at various points of the structure but they are of minor important and cost. Therefore, all of the components of the chambers should be designed and installed to develop the best possible long term economics.

### Determining Roof Areas

The proposed design of regenerator chambers for the producer gas furnace to be presented will have chambers 30 feet long, the air chamber 16 feet wide, and the gas chamber 10 feet wide. The included angle of the roof of the air chamber will be 108 degrees and that of the gas chamber 60 degrees. By the use of the foregoing figures and the appropriate data of Table XXXIX (STEEL, Jan. 9, 1933,) the total area of the four regenerator chamber roofs may be calculated as about 1740 square feet.

If the life of the roofs is taken to be ten years then the life economics may be evaluated as in Table CXIII. In this the first cost is from the unit values of Table CXI multiplied by the roof areas as above.

The radiation cost is solved through the use of equation 18, No. 4 (STEEL, Nov. 21, 1932), in which is incorporated the appropriate emission data, columns d and g, Table CXII.

The comparative total costs of the bare roofs, column c, Table CXIII, once again indicate and emphasize the great value of a correct original conception of any problem involving the application of refractories in high temperature operations, and the figures of column f, the high value of insulation, when correctly applied.

### Regenerator Side and Center Walls

Examination of upper sidewalls, i. e., the walls above the rider system, of the typical furnaces discloses four types of construction as follows:

Fire brick with an outer veneer of common brick found in furnaces A, P, B and D and representing the older style of construction. Fire brick, and insulation covered with plate, shown in connection with the regenerators of furnaces J, K, N, O, L, H, F and M and representing the most economic design. Fire brick, insulation, and commonbrick, plate-covered found in furnaces I and G and fire brick, insulation with a common brick veneer found in furnace E.

The construction of the lower side walls is somewhat different than the upper walls principally through the thickening of the lower walls by 2½ or 4½ inches to provide a ledge upon which to support the rider tile.

In all discussion anent regenerator side walls, the construction is considered as being similar throughout to the upper wall arrangement.

The four furnaces, A, P, B and D having the first type walls are constructed uniformly of 13½ inches best brick and 9 inches of common brick and accordingly this is the only arrangement of this type discussed.

Of the eight furnaces having the second type of construction, N, O, F and M employ 13½ inches of best fire brick, N and O having 2½ inches, F 4½ inches, and M 4 inches of class B insulation. The fire brick thickness, furnaces J, K, L and H is 18 inches. Class B insulation is 4½ inches thick, J, K and H; and, 5 inches, L.

### Plate Thickness Varies

The thickness of the steel plate found is ½-inch, N and O ⅜-inch, L and F; and, ¼-inch for J, K, H and M.

As the rather intricate wall construction of furnaces I, G and E offers no apparent advantages no further consideration is given to these types.

In order to develop the economics of regenerator walls, three types of outer walls will be analyzed, namely, 13½ inches of best fire brick with 9 inches of common brick; 13½ inches of best fire brick, 4½ inches of class B insulation, and ¼-inch plated sides and a similar arrangement, but with 18 inches of best fire brick, designated types A, B and C, respectively.

The unit refractory construction cost of the three arrangements is listed in Table CXIV, the basic prices being from Table X. The price used for the ¼-inch steel plate is 6 cents per pound in place.

(*To be continued*)

Table CXIV

## Costs of Various Types Regenerator Side Wall Construction Per Square Foot

| Material | —Type A— Thickness, inches a | Cost b | —Type B— Thickness, inches c | Cost d | —Type C— Thickness, inches e | Cost f |
|---|---|---|---|---|---|---|
| Best fire brick | 13½ | $1.89 | 13½ | $1.89 | 18 | $2.52 |
| Common brick | 9 | 1.06 | .... | ..... | .... | ..... |
| Class B insulation | .... | ..... | 4½ | 0.60 | 4½ | 0.60 |
| Steel plate | .... | ..... | ¼ | 0.60 | ¼ | 0.60 |
| Total | 22½ | $2.95 | 18¼ | $3.09 | 22¾ | $3.72 |

## Makes New Special Steel

A new alloy steel which expands under heat at the same rate as glass has been added by the Allegheny Steel Co., Brackenridge, Pa., to its line of stainless, electrical, and other special steels, according to an announcement of W. F. Detwiler, executive vice president. At approximately $2 per pound, this steel is the company's highest priced alloy.

Production of the new metal, Fernico, has started at the rate of 15,000 pounds a month. The first commercial application was in use for electrical connections in the base of the new metal radio tubes recently placed on the market (see STEEL, May 13, page 28).

### Open Hearth Steel Sheets

Galvanized Black & Blue Annealed Sheets, Corrugated—V Crimped Sheets—Roll Roofing and Weather Board Siding.

### Strip Steel & Strip Steel Sheets

Hot and Cold Rolled Strip Steel, Single Pickled, Full Finish, High Finish and Auto Body Sheets. Many gauges and grades up to seventy-five inches wide now available.

### Coke Tin Plate & Tin Mill Black Plate

Common, Kanner's Special, Best Cokes and Charcoals (Plain, Coated or Lacquered). Tin Mill Black Plate (all finishes) (Coated or Lacquered if desired).

### Terne Plate & Long Terne Sheets

Special Alloy Coated and heavier coated Manufacturing Ternes, 8 lbs. to 40 lbs. coated roofing and fire door ternes. Common and Special Finished Long Terne Sheets.

### Structurals & Shapes

Angles, Beams and Channels. Round, Square and Flat Bars, Splice Bars, Reinforcing Bars, Rails, Track Spikes, Steel Plates and Tie Plates.

### Iron & Steel

Pig Iron—Open Hearth Steel Billets—Slabs, Sheet Bar and Skelp.

### By-Products

Coke — Tar — Benzol — Toluol—Ammonium Sulphate.

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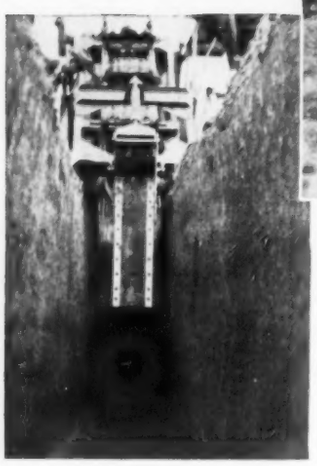
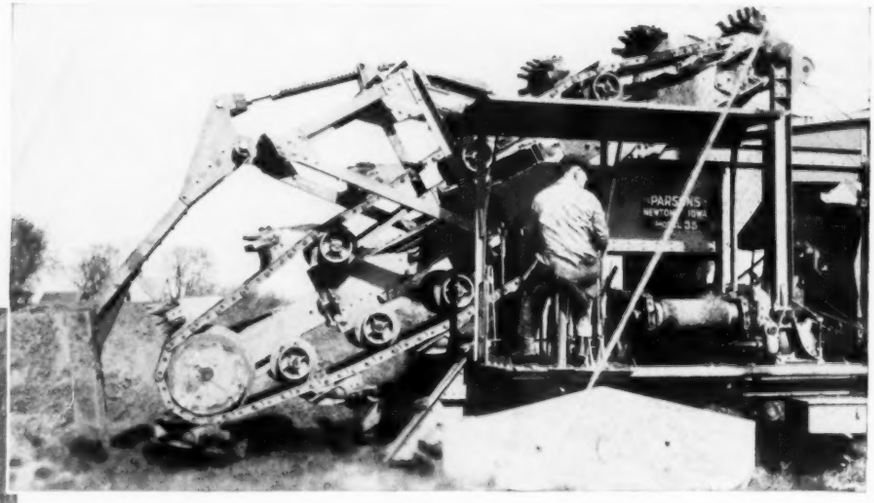
# Chrome-Vanadium Steel Trencher Teeth

## *Bite Through Any Kind of Soil*





Under all kinds of conditions . . . blue clay . . . shale . . . boulders . . . frozen soil...even New Mexico caliche...Parsons Trenchers cut their way.

There are Parsons Trenchers for cross-country pipe line work . . . for digging uphill and down . . . for cutting through all kinds of soil. There are heavy duty models that cut through clean-walled sewer trenches up to 42 inches wide and 18 *feet* deep. There are self-contained models that travel . . . anywhere . . . on their own pneumatic tires. They are all alike in one particular—their digger teeth are made of hard . . . tough . . . heat treated . . . wear-resisting Chrome-Vanadium Steel.

Perhaps you are not interested in digger teeth, but if you are looking for a tougher, better steel of high anti-fatigue and shock-resisting qualities, the metallurgists of the Vanadium Corporation of America will be glad to confer with you. No obligation, of course.

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# VANADIUM STEELS

*for strength, toughness and durability*

# NEW EQUIPMENT

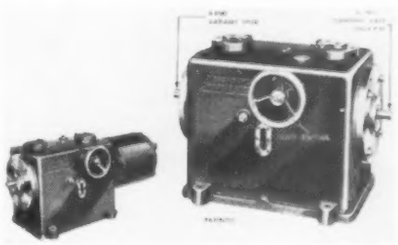
**These items of industrial equipment were announced by manufacturers last week and will be described in early issues of STEEL:**

Two new contour measuring projectors, Bausch & Lomb Optical Co., Rochester, N. Y.
Rotary magnetic chuck, O. S. Walker Co. Inc., Worcester, Mass.
Swivelling magnetic chuck with central control, O .S. Walker Co. Inc., Worcester, Mass.
Three new die sinking cutters, Pratt & Whitney Co., Hartford, Conn.
Six-inch grinder, Rotor Air Tool Co., Cleveland.
Condensate return units, Worthington Pump & Machinery Corp., Harrison, N. J.
Swinging arm spray coating machine and down-draft spray booth, DeVilbiss Co., Toledo, O.
Welding timers, Welding Timer Corp., New York.
Through flow cone valves, Anderson Valve Corp., Pittsburgh.
Illumination analyzer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.
Bending or curving rolls, Geo. Whiting Co., Chicago.
Butane locomotive, Fate-Root-Heath Co., Plymouth, O.
Threading machine, Geometric Tool Co., New Haven, Conn.

## Hydraulic Variable Speed Transmission—

Vickers Inc., 1400 Oakman boulevard, Detroit, recently introduced a hydraulic variable speed transmission in which any desired speed between 5 and 750 revolutions per minute is secured accurately and smoothly by simply turning a handwheel which varies stroke and delivery of a multiple piston pump. Additional adjustments permit speeds up to 2500 revolutions per minute. Hydraulic, mechanical or electrical remote control can be substituted for the manual control shown in the accompanying illustration.

Rotation in either direction can be provided for either end of the unit, and this can later be changed on the job without additional parts. Units can also be provided with mechanism for instantaneous change of direction. The unit is totally enclosed, making the transmission unaffected by moisture or dirt in the atmosphere. A direct-connected 1200 RPM motor drives the transmission. Units in stock have maximum output of 6 horsepower continuous duty at 1000 pounds per square inch and 7½ horsepower intermittent service at 1250 pounds per square inch. Larger units will be made available later.



*Infinitely variable speed provided by Vickers hydraulic transmission*

• • •

## Ball Bearing Line Extended—

Norma-Hoffmann Bearings Corp., Stamford, Conn., recently announced that its "Greaseal" line of felt-protected precision ball bearings has been extended to include three larger sizes—40, 45, and 50 millimeter bore. The line includes three series: "7000", with single felt seal; "7000-P" with single felt seal and plate shield; and "77000," with double felt seal. The two latter series are fully enclosed, for the retention of lubricant and exclusion of dirt and moisture. All three of these types are self-contained units distinguished by the removable felt seal consisting of thick, closely-fitting felts between removable plates—forming an effective labyrinth against the recessed inner ring.

The felt seal, being completely within the confines of both rings, is not exposed to injury. Wide, solid inner and outer rings make inserts in the housing unnecessary, and safeguard against looseness, slippage, and escape of lubricant past the outer ring. The seal construction is such that all distortion of the ball races is avoided. Grease capacity in all three types is ample for long periods of service, without renewal.

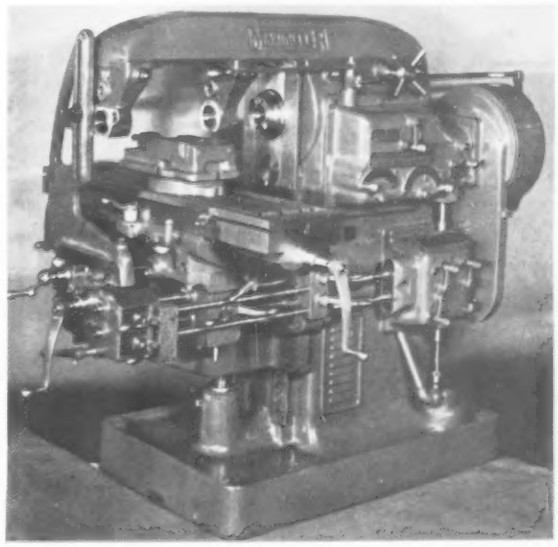
• • •

## Milling Machines—

Sidney Machine Tool Co., Sidney, O., is announcing new and improved milling machines designated Nos. 2, 3, 4 and 5 in plain, universal and vertical types. The design of the new units, shown herewith, combines simple sound and rigid unit construction for the purpose of lower maintenance cost, and other features in line with the present day trend in machine design.

Speed and feed transmission rolls on 32 radial and combination radial and thrust type antifriction bearings. Speed and feed changes are made through sliding spur tooth alloy steel heat treated gears which are mounted on ten splined shafts. The speed and feed transmission is lubricated by means of both splash and force feed lubrication.

Knee of the machine is of box



*ONE of the new Maximiller milling machines developed by Sidney Machine Tool Co. The table of the universal type is supported by two outside bearings in addition to the conventional center bearing. This general support affords the accuracy necessary and equals that of the table of a plain type machine*

type construction and designed to permit the cross feed screw to be mounted directly in the center of the dovetailed bearing which permits a free and accurate movement in and aiso out of the table. An angular tongued gib is employed for holding the knee to the milling machine column. This gib is adjusted by sliding it up or down in an angular tongue slot and is seated metal to metal by four ¾-inch bolts.

Flexibility and operating convenience of the new miller has not been overlooked. The operator need not move from his usual working position in order to gain work motion in any direction, starting or stopping of cutter and locking in position of either table or up and down and in and out movements. Power quick traverse is available in all directions with the cutter stationary or revolving. Controls are provided with interlocking mechanism to prevent engagement of both power quick traverse and power feed levers for the same motion at the same time.

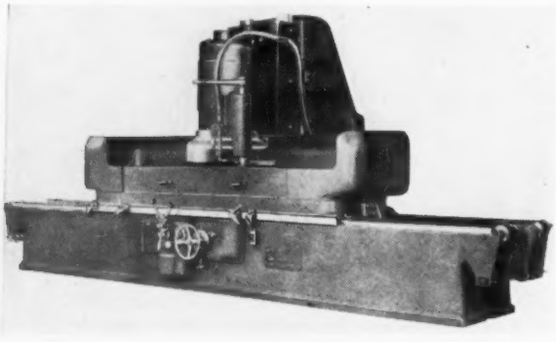
Arbor support is constructed of heat treated aluminum alloy. Lightness in weight permits the operator to handle it on and off the machine with comparative ease. It is designed with a large oil reservoir to supply ample lubrication to the arbor bearings for a week's duration under constant usage without refilling. Column of the machine is arranged for motor drive in base through either silent chain or V-belt. It is cast of the same fine grain semisteel as the knee, saddle, table and all other important members of this machine.

• • •

### Vertical Spindle Surface or Face Grinder—

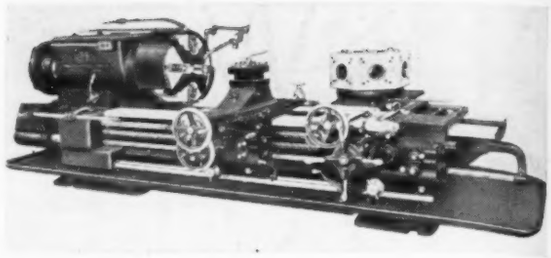
Hanchett Mfg. Co., Big Rapids, Mich., has introduced a No. 486 vertical spindle surface or face grinder, shown herewith. It embodies a work table 18 inches wide and 86 inches long, hydraulically operated with speeds from 0 to 90 feet per minute. The bed is box type design of such length that the work table never overhangs at the extreme end of the stroke in either direction.

The grinding wheel may be the



*THIS new Hanchett No. 486 vertical spindle surface or face grinder has a work table operated hydraulically at speeds ranging from 0 to 90 feet per minute. The work table never overhangs the bed at the extreme end of the stroke in either direction*

*DESIGNED to meet the demand for a general purpose machine, this Libby-Uni-Flex can be adapted to large quantity production or easily and inexpensively changed to produce one piece or a few pieces*

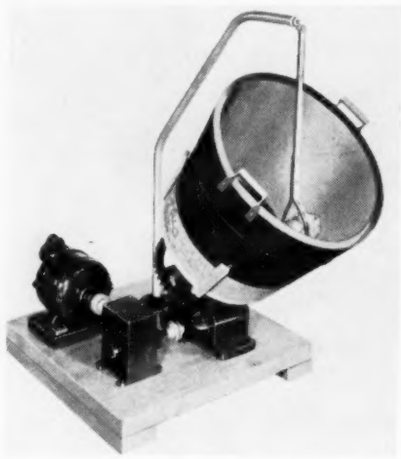


cylinder or segmental type in sizes up to 22 inches in diameter. Feed is both manual and automatic with a separate power unit for raising and lowering the wheel head. For lubrication a pressure system is employed for the ways and forced feed for the spindle bearing.

• • •

### Small Plating Barrel—

Udylite Co., Detroit, recently brought out an inexpensive barrel plating unit to handle occasional



*Udylite handiplater is provided with detachable cylinder*

handfuls of work or the production plating of small quantities of small parts. This Handiplater, as it is known, is shown herewith. It will accommodate any plating solution common to plating barrel operations. The cylinder is detachable, making it possible to use the latter for several plating operations. Moreover, the detachable cylinder provides easy manipulation and operation. Cylinder capacity ranges from a handful to 25 pounds. The unit is motor driven, powered by a 1/6 horsepower motor which can be operated from a light socket.

• • •

### General Purpose Machine—

International Machine Tool Co., Indianapolis, recently developed a general purpose machine, shown above, that will bore, turn, face, form, drill, recess, thread, ream, undercut, tap, etc. It will cut threads from 2 to 32, has 72 feeds in either direction in both aprons independent of the rapid traverse, and has feeds that range from 0.007 to 0.500 in either direction in each apron.

The Libby Uni-Flex, as it is known, is particularly adapted to maintenance work. When equipped with power feed cross sliding turret with built-in taper attachment, compound rest with power angular feed with taper attachment, with long bed and standard set of tools, it will handle almost any suitable piece at a saving over previous methods, the company points out. The machine can be furnished in swings from 18 to 34½ inches, and with gap beds to 50 inches; spindle bores from 5¼ to 12½ inches; and for center work to 16 feet. In each case the bed, pan and steel ways are in one piece which provides rigidity and accuracy in operation.

• • •

### New Extension Link for Collapsible Taps—

Landis Machine Co. Inc., Waynesboro, Pa., has designed a special link for use between the body and head of its style LT collapsible taps and style LM receding chaser collapsible taps to tap threads that are longer than provided for with standard taps. This construction is possible because of the fact that on these taps the head is made detachable from the body in order to permit the use of several heads of different sizes on the same body.

The extension link is machined on one end and drilled and tapped to fit the tap body while the opposite end is prepared to fit the tap head. This permits using a standard body and a standard head instead of re-

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It has proved of especial benefit in replacing carbon steel tubes in refinery tube applications, assuring longer tube life; reduced operating hazards; and fewer replacements.

In boiler and superheater service also the great reserve strength and excellent high temperature yield stress value of DM Steel have considerably reduced tube costs.

Try Timken DM Steel wherever you have a high temperature job that is too tough for carbon steel. You will find it a real economy.

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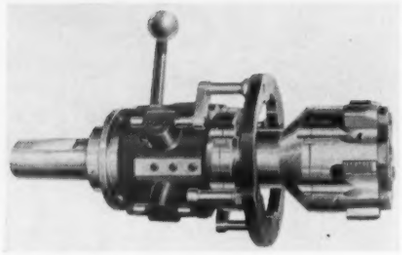


*Extension link is feature of Landis collapsible taps*

quiring the special manufacture of these parts. Any length of link can be provided for the length of thread desired. This link also can be used on a tap required for reaching to the bottom of a deep hole even though a short length of thread is required. If a short length of tread is also to be tapped, the link can be removed and the head attached directly to the body, making a standard tap.

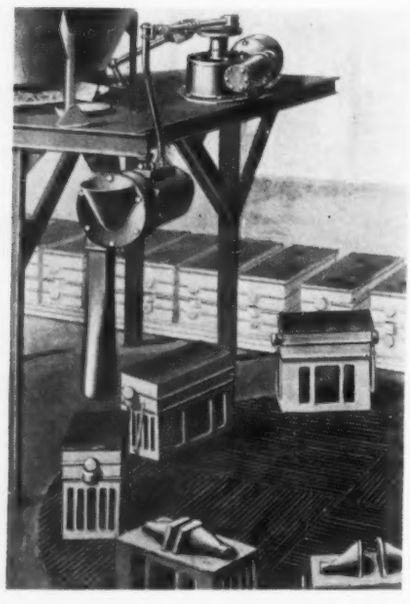
Other advantages of this construction are lower costs, better deliveries, and taps in service can be fitted with the link if it should become necessary to use the tap for longer threads than originally provided. The illustration herewith shows a No. 6LT body with 7 inch head with link to provide a reach of 6½ inches as required for tapping straight through a special pipe coupling. The application to a style LM tap would be similar.

◆ ◆ ◆

### Automatic Sandslinger—

Beardsley & Piper Co., Chicago, recently brought out a new sandslinger, shown herewith, for production foundries to provide entirely automatic molding. It is claimed that this unit requires no labor for the ramming operation, provides complete mold density control, reduces floor space and flask requirements, minimizes discount and lessens flask and pattern wear.

The machine consists of a swing type sandslinger mounted on a superstructure and fed by suitable sand supply. The ramming head is actuated mechanically by a robot which has an adjustable movement in any direction from a straight line to a full circle. The ramming unit, being suspended by a universal swivel joint at the top, rams over any predetermined area, handling with equal facility any size, depth or shape of flask.



*Beardsley & Piper sandslinger for production foundries*

◆ ◆ ◆

### Motor-Driven Drill Grinders—

Hisey-Wolf Machine Co., Cincinnati, has introduced a new grinder designed for sharpening straight or taper shank drills; 1, 2, 3 or 4 lip drills; flat or chucking drills; flat twisted drills, as well as those with over-size shanks. This unit, shown herewith, provides for adjustable clearance and adjustable point angle.

*New Hisey-Wolf motor-driven drill grinder built in two sizes*

The grinder is regularly supplied with one cup-shaped grinding wheel and one wheel for point thinning. The latter can be replaced with a straight face wheel for tool grinding with the use of a tool rest. Two sizes of the machine for direct and alternating current are available; one for drills No. 52 to 1¼-inch diameter, and the other for drills ⅛ to 2½ inches in diameter.

◆ ◆ ◆

### Electrode Holder—

Metalweld Inc., Twenty-sixth and Hunting Park avenue, Philadelphia, recently brought out a new navy type electrode holder which eliminates poor contacts along the path from the generator to the arc. The construction of this device, shown herewith, provides positive rod contact, eliminates springs, lever and soldered joints, keeps the handle from heating and, due to its long fibre handle, permits the welder to grasp the holder close to the electrode assuring complete control of the electrode under all conditions.

*Metalweld electrode holder designed to eliminate poor contacts*

The above features, coupled with simplicity of design which eliminates joints to work loose and parts to get out of order and be replaced, make it an ideal holder for all types of arc welding work. With this holder the electrode is held in a vise-like grip, yet a slight twist with a fresh rod releases the old stub and another twist in the opposite direction places the new electrode in the jaws of the "vise" and the welder is ready to strike his arc.

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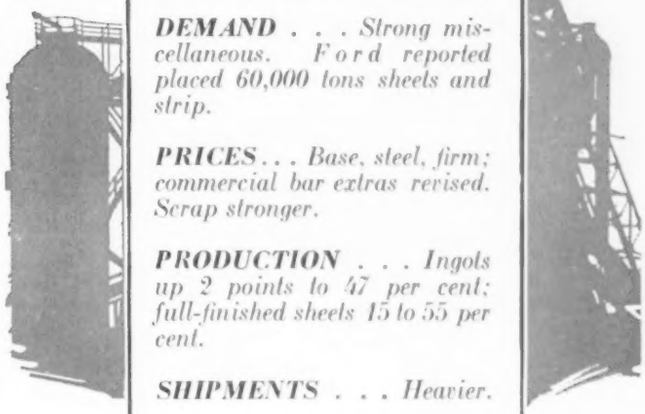
### Vibration Eliminator—

Vibration Eliminator Co., 41-26 Thirty-seventh street, Long Island City, N. Y., has brought out a vibration eliminator which consists chiefly of a base stamping and supporting housing to which the leg or base of a machine may be rigidly fastened. The device relies for its efficiency in the various sizes upon a new table of selected loadings on pure natural cork. Adequate loadings and ease of installation are thus assurred. The isolating materials used in the unit will maintain its efficiency during the life of the machine and is not affected by water, oils or temperature changes. It does not take a permanent set under excessive loading, and will not further compress after the initial compression. Natural cork has a time lag in its return after compression which prevents a bouncing action.

# Diverse Demands Lift Steel Rate to 47

## Ford Orders for 60,000 Tons Reported; Iron, Steel Output Again Ahead of 1934



### MARKET IN TABLOID

***DEMAND*** . . . *Strong miscellaneous. Ford reported placed 60,000 tons sheets and strip.*

***PRICES*** . . . *Base, steel, firm; commercial bar extras revised. Scrap stronger.*

***PRODUCTION*** . . . *Ingots up 2 points to 47 per cent; full-finished sheets 15 to 55 per cent.*

***SHIPMENTS*** . . . *Heavier.*

DESPITE a sharp reduction in automobile assemblies last week, due to widespread suspensions for vacations, and relatively light support from new construction and railroads, steel demand was sufficient to lift steelworks operations 2 more points to 47 per cent, a strong situation prevailing in major districts.

This clearly indicated the sustained or improved volume of miscellaneous steel buying, continued demand for agricultural equipment, for machinery and other durable goods.

With the last few days of July estimated, operations for the month averaged 40.1 per cent, practically unchanged from 40.3 in June. In only one year since 1919 did July daily average output exceed that of June—in 1928—and in only two other years, 1922 and 1923, did it come close to approximating June. As output last month was about 40 per cent higher than in July last year, the month apparently restored this year to a slight lead over the comparable period in 1934.

Daily average pig iron production in July—49,033 gross tons—was 5.6 per cent less than in June, and total for the month—1,520,016 tons—was down 2.4 per cent. Output for seven months this year was 11,349,950 tons, 2.4 per cent higher than in the first seven last year. A net gain of one active stack was made in the month, to 92 operating July 31.

Automobile assemblies last week were down 13,000 units to 70,000. Ford was reported to have allocated about 60,000 tons of sheets and strip on its recent inquiry for 140,000 tons of steel. Automobile manufacturers generally are making final purchases for current models, and in many instances production is being prolonged because of brisk retail demand. In compliance with their agreement with the government for early introduction of 1936 models to stabilize the industry, some makers are distributing specifications for material for the new series, though not yet released.

Structural shape awards for the week were only 14,400 tons, including 7600 tons of piling for public works projects. The Ohio River Co., Cincinnati, awarded towboats and barges requiring 3500 tons of plates, and 3600 tons of plates were placed for a 20-mile 24-inch pipe line for Phillips Petroleum Co., Bartlesville, Okla.

Chesapeake & Ohio entered the market for 100 automobile freight cars. Domestic freight car awards in July, 500, brought the total for seven months this year to 6833, compared with 23,278 in the same period last year. Other statistics: June iron and steel imports, 33,208 gross tons, 30.4 per cent less than in May; for seven months this year, 182,891 tons, 9 per cent more than last year. June exports, 289,687 tons, 1 per cent over May; for seven months, 1,595,933 tons, 27 per cent over last year.

Base prices on steel are firm. Leading producers have issued a new card of extras for commercial steel bars, effective Aug. 10 for this quarter, "to bring them more nearly in line with present manufacturing costs." This eliminates the $5 a ton extra for forging quality, and increases certain size extras. On the other hand, some sheet mills are waiving their extras of $3 to $7 a ton for deep-drawing material for the automobile industry.

By substituting "may" for "must" PWA has removed a principal objection to its original order which stated foreign steel must be used in PWA projects, where price was 15 per cent lower than the domestic market.

Chicago district steelworks operations last week advanced 3 points to 52 per cent; Youngstown 4 to 53; eastern Pennsylvania 2½ to 31½; Cleveland 6 to 54; Wheeling 3 to 76. New England was down 7 to 25. Pittsburgh held at 41, and others also were unchanged.

STEEL's iron and steel price composite increased 4 cents, due to scrap; the finished steel composite remained $54, while the scrap index advanced 38 cents to $11.63.

# COMPOSITE MARKET AVERAGES

| | Aug. 3 | July 27 | July 20 | One Month Ago July, 1935 | Three Months Ago May, 1935 | One Year Ago Aug., 1934 | Five Years Ago Aug., 1930 |
|---|---|---|---|---|---|---|---|
| Iron and Steel | $32.59 | $32.55 | $32.42 | $32.44 | $32.35 | $32.24 | $32.90 |
| Finished Steel | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 54.00 | 51.72 |
| Steelworks Scrap | 11.63 | 11.25 | 10.63 | 10.64 | 10.27 | 9.98 | 12.62 |

Iron and Steel Composite:—Pig iron, scrap, billets, sheet bars, wire rods, tin plate, wire, sheets, plates, shapes, bars, black pipe, rails, alloy steel, hot strip, and cast iron pipe at representative centers. Finished Steel Composite:—Plates, shapes, bars, hot strip, nails, tin plate, pipe. Steelworks Scrap Composite:—Heavy melting steel and compressed sheets.

# A COMPARISON OF PRICES

Representative Market Figures for Current Week; Average for Last Month, Three Months and One Year Ago

## Finished Material

| | Aug. 3, 1935 | July, 1935 | May, 1935 | Aug., 1934 |
|---|---|---|---|---|
| Steel bars, Pittsburgh | 1.80c | 1.80c | 1.80c | 1.80c |
| Steel bars, Chicago | 1.85 | 1.85 | 1.85 | 1.85 |
| Steel bars, Philadelphia | 2.11 | 2.11 | 2.11 | 2.09 |
| Iron bars, Terre Haute, Ind. | 1.75 | 1.75 | 1.75 | 1.75 |
| Shapes, Pittsburgh | 1.80 | 1.80 | 1.80 | 1.80 |
| Shapes, Philadelphia | 2.01½ | 2.01½ | 2.01½ | 2.00½ |
| Shapes, Chicago | 1.85 | 1.85 | 1.85 | 1.85 |
| Tank plates, Pittsburgh | 1.80 | 1.80 | 1.80 | 1.80 |
| Tank plates, Philadelphia | 2.00 | 1.99 | 1.99 | 1.98½ |
| Tank plates, Chicago | 1.85 | 1.85 | 1.85 | 1.85 |
| Sheets, No. 10, hot rolled, Pitts. | 1.85 | 1.85 | 1.85 | 1.85 |
| Sheets, No. 24, hot ann., Pitts. | 2.40 | 2.40 | 2.40 | 2.40 |
| Sheets, No. 24, galvan., Pitts. | 3.10 | 3.10 | 3.10 | 3.10 |
| Sheets, No. 10, hot rolled, Gary | 1.95 | 1.95 | 1.95 | 1.95 |
| Sheets, No. 24, hot anneal., Gary | 2.55 | 2.55 | 2.55 | 2.55 |
| Sheets, No. 24, galvan., Gary | 3.20 | 3.20 | 3.20 | 3.20 |
| Plain wire, Pittsburgh | 2.30 | 2.30 | 2.30 | 2.30 |
| Tin plate, per base box, Pitts. | 5.25 | 5.25 | 5.25 | 5.25 |
| Wire nails, Pittsburgh | 2.60 | 2.60 | 2.60 | 2.60 |

## Semifinished Material

| | | | | |
|---|---|---|---|---|
| Sheets bars, open-hearth, Youngs. | $28.00 | $28.00 | $28.00 | $28.00 |
| Sheet bars, open-hearth, Pitts. | 28.00 | 28.00 | 28.00 | 28.00 |
| Billets, open-hearth, Pittsburgh | 27.00 | 27.00 | 27.00 | 27.00 |
| Wire rods, Pittsburgh | 38.00 | 38.00 | 38.00 | 38.00 |

## Pig Iron

| | Aug. 3, 1935 | July, 1935 | May, 1935 | Aug., 1934 |
|---|---|---|---|---|
| Bessemer, del. Pittsburgh | $19.81 | $19.81 | $19.80 | $19.76 |
| Basic, Valley | 18.00 | 18.00 | 18.00 | 18.00 |
| Basic, eastern, del. eastern Pa. | 19.76 | 19.81 | 19.81 | 19.76 |
| No. 2 foundry, del. Pittsburgh | 19.31 | 19.31 | 19.30 | 19.26 |
| No. 2, foundry, Chicago | 18.50 | 18.50 | 18.50 | 18.50 |
| Southern No. 2, Birmingham | 14.50 | 14.50 | 14.50 | 14.50 |
| No. 2X eastern, del. Philadelphia | 20.68 | 20.68 | 20.68 | 20.63 |
| Malleable, Valley | 18.50 | 18.50 | 18.50 | 18.50 |
| Malleable, Chicago | 18.50 | 18.50 | 18.50 | 18.50 |
| Lake Superior charcoal, del. Chi. | 24.25 | 24.25 | 24.25 | 24.04 |
| Ferromanganese, del. Pittsburgh | 90.13 | 90.13 | 90.13 | 89.79 |
| Gray forge, del. Pittsburgh | 18.67 | 18.67 | 18.66 | 18.88 |

## Scrap

| | | | | |
|---|---|---|---|---|
| Heavy melting steel, Pittsburgh | $13.25 | $12.30 | $12.00 | $11.45 |
| Heavy melt. steel, No. 2, east. Pa. | 9.75 | 9.55 | 9.25 | 8.45 |
| Heavy melting steel, Chicago | 11.75 | 10.40 | 10.20 | 9.25 |
| Rails for rolling, Chicago | 13.25 | 11.25 | 11.05 | 10.50 |
| Railroad steel specialties, Chicago | 12.75 | 12.00 | 11.40 | 10.25 |

## Coke

| | | | | |
|---|---|---|---|---|
| Connellsville, furnace, ovens | $3.25 | $3.30 | $3.60 | $3.60 |
| Connellsville, foundry, ovens | 4.00 | 4.25 | 4.60 | 4.60 |
| Chicago, by-product foundry, del. | 9.25 | 9.25 | 9.25 | 9.25 |

# Steel, Iron, Raw Material, Fuel and Metals Prices

*Except when otherwise designated, prices are base, f.o.b. cars. Asterisk denotes price change this week.*

## Sheet Steel

**Hot Rolled No. 10, 24-48 in.**

| | |
|---|---|
| Pittsburgh | 1.85c |
| Gary | 1.95c |
| Chicago, delivered | 1.98c |
| New York, del. | 2.20c |
| Philadelphia, del. | 2.16c |
| Birmingham | 2.00c |
| St. Louis, del. | 2.17c |
| Pacific ports, f.o.b. cars, dock | 2.40c |

**Hot Rolled Annealed No. 24**

| | |
|---|---|
| Pittsburgh | 2.40c |
| Gary | 2.50c |
| Chicago, delivered | 2.53c |
| Detroit, delivered | 2.60c |
| New York, del. | 2.75c |
| Philadelphia, del. | 2.71c |
| Birmingham | 2.55c |
| St. Louis, del. | 2.72c |
| Pacific ports, f.o.b. cars, dock | 3.05c |

**Galvanized No. 24**

| | |
|---|---|
| Pittsburgh | 3.10c |
| Gary | 3.20c |
| Chicago, delivered | 3.23c |
| Philadelphia, del | 3.41c |
| New York, del. | 3.45c |
| Birmingham | 3.25c |
| St. Louis, del. | 3.42c |
| Pacific ports, f.o.b. cars, dock | 3.70c |

**Tin Mill Black No. 28**

| | |
|---|---|
| Pittsburgh | 2.75c |
| Gary | 2.85c |
| St. Louis, delivered | 3.07c |

**Cold Rolled No. 10**

| | |
|---|---|
| Pittsburgh | 2.50c |
| Gary | 2.60c |
| Detroit, delivered | 2.70c |
| Philadelphia, del. | 2.81c |
| New York, del. | 2.85c |
| Pacific ports, f.o.b. cars, dock | 3.10c |

**Cold Rolled No. 20**

| | |
|---|---|
| Pittsburgh | 2.95c |
| Gary | 3.05c |
| Detroit, delivered | 3.15c |
| Philadelphia, del. | 3.26c |
| New York, del. | 3.30c |

**Enameling Sheets**

| | |
|---|---|
| Pittsburgh, No. 10 | 2.50c |
| Pittsburgh, No. 20 | 3.10c |
| Gary, No. 10 | 2.60c |
| Gary, No. 20 | 3.20c |

## Tin and Terne Plate

Gary base, 10 cents higher.

| | |
|---|---|
| Tin plate, coke base con. (box) Pitts. | $5.25 |
| Do., waste-waste | 2.75c |
| Do., strips | 2.50c |
| Long ternes, No. 24 unassorted, Pitts. | 3.40c |
| Do., Gary | 3.50c |

## Corrosion and Heat-Resistant Alloys

Pittsburgh base, cents per lb.

**Chrome-Nickel**

| | No. 302 | No 304 |
|---|---|---|
| Bars | 23.00 | 24.00 |
| Plates | 26.00 | 28.00 |
| Sheets | 33.00 | 35.00 |
| Hot strip | 20.75 | 22.75 |
| Cold strip | 27.00 | 29.00 |

**Straight Chromes**

| | No. 410 | No. 430 | No. 442 | No. 446 |
|---|---|---|---|---|
| Bars | 17.00 | 18.50 | 21.00 | 26.00 |
| Plates | 20.00 | 21.50 | 24.00 | 29.00 |
| Sheets | 25.00 | 28.00 | 31.00 | 35.00 |
| Hot strip | 15.75 | 16.75 | 21.75 | 26.75 |
| Cold strip | 20.50 | 22.00 | 27.00 | 35.00 |

## Steel Plates

| | |
|---|---|
| Pittsburgh | 1.80c |
| New York, del. | 2.09c |
| Philadelphia, del. | 1.99c |
| Boston, delivered | 2.22c |
| Buffalo, delivered | 2.05c |
| Chicago or Gary | 1.85c |
| Cleveland, del. | 1.99½c |
| Birmingham | 1.95c |
| Coatesville, base | 1.90c |
| Sparrows Pt., base | 1.90c |
| Pacific ports, f.o.b. cars, dock | 2.35c |
| St. Louis, delivered | 2.07c |

## Structural Shapes

| | |
|---|---|
| Pittsburgh | 1.80c |
| Philadelphia, del. | 2.01½c |
| New York, del. | 2.06½c |
| Boston, delivered | 2.20½c |
| Bethlehem | 1.90c |
| Chicago | 1.85c |
| Cleveland, del. | 2.00c |
| Buffalo | 1.90c |
| Gulf Ports | 2.20c |
| Birmingham | 1.95c |
| Pacific ports, f.o.b. cars, dock | 2.35c |

## Bars

**Soft Steel**

| | |
|---|---|
| Pittsburgh | 1.80c |
| Chicago or Gary | 1.85c |
| Duluth | 1.95c |
| Birmingham | 1.95c |
| Cleveland | 1.85c |
| Buffalo | 1.90c |
| Detroit, delivered | 1.95c |
| Pacific ports, f.o.b. cars, dock | 2.35c |
| Philadelphia, del. | 2.11c |
| Boston, delivered | 2.22c |
| New York, del. | 2.15c |
| Pitts., forg. qual. | 1.95c-2.05c |

**Rail Steel**

To Manufacturing Trade

| | |
|---|---|
| Pittsburgh | 1.70c |
| Chicago or Gary | 1.75c |
| Moline, Ill. | 1.75c |
| Cleveland | 1.75c |
| Buffalo | 1.80c |

**Iron**

| | |
|---|---|
| Troy, N. Y. | 1.70c |
| Terre Haute, Ind. | 1.75c |
| Chicago | 1.80c |
| Philadelphia | 1.91c |
| Pittsburgh, refined | 2.75-7.50c |

**Reinforcing**

New billet, straight lengths, quoted by distributors.

| | |
|---|---|
| Pittsburgh | 2.05c |
| Chicago, Gary, Buffalo, Cleve., Birm., Young | 2.10c |
| Gulf ports | 2.45c |
| Pacific coast ports f.o.b. cars dock | 2.45c |
| Philadelphia, del. | 2.36c |

Rail Steel

Straight lengths quoted by distributors

| | |
|---|---|
| Pittsburgh | 1.90c |
| Chicago, Buffalo, Cleveland, Birm., Young. | 1.95c |
| Gulf ports | 2.30c |

## Wire Products

(Prices apply to straight or mixed carloads; pool cars, or less, 15c up. 10% dis. on nail extras on stright or mixed carloads to one consignee.)

Base Pitts.-Cleve. 100 lb. keg.

| | |
|---|---|
| Standard wire nails | $2.60 |
| Cement coated nails | 2.60 |
| Galvanized nails, 15 gage and coarser | 4.60c |
| do., 16 gage and finer | 5.10c |

(Per pound)

| | |
|---|---|
| Polished staples | 3.30c |
| Galvanized fence staples | 3.55c |
| Barbed wire, galv. | 3.00c |
| Annealed fence wire | 2.45c |
| Galvanized fence wire | 2.80c |
| Woven wire fencing (base column, c.l.) | $63.00 |
| Plain wire, 6-9 gage to mfg. trade | 2.30c |

Anderson, Ind., (merchant products only) and Chicago up $1; Duluth up $2; Birmingham up $3.

| | |
|---|---|
| Spring wire, Pittsburgh or Cleveland | 2.90c |

Do., Chicago up $1, Worcester, $2.

## Cold-Finished Carbon Bars and Shafting

Base Pitts., one size, shape, grade, shipment at one time to one destination

| | |
|---|---|
| 10,000 to 19,999 lbs | 1.95c |
| 20,000 to 59,999 lbs. | 1.90c |
| 60,000 to 99,999 lbs. | 1.85c |
| 100,000 lbs. and over | 1.82½c |

Gary, Ind., Cleveland, up 5c; Buffalo, up 10c; Detroit, up 20c; eastern Michigan, up 25c.

## Alloy Steel Bars (Hot)

Pittsburgh, Buffalo, Chicago, Massillon, Canton, Bethlehem 2.45c

| Alloy S.A.E. | Alloy Diff. | Alloy S.A.E. | Alloy Diff. |
|---|---|---|---|
| 2000 | 0.25 | 3100 | 0.55 |
| 2100 | 0.55 | 3200 | 1.35 |
| 2300 | 1.50 | 3300 | 3.80 |
| 2500 | 2.25 | 3400 | 3.20 |

4100 0.15 to 0.25 Mo....0.50
4600 0.20 to 0.30 Mo. 1.25-1.75 Ni....1.05
5100 0.80-1.10 Cr....0.45
5100 Cr. spring....base
6100 bars....1.20
6100 spring....0.70
Cr., Ni., Van....1.50
Carbon Van....0.95
9250....Carbon base plus extras

## Piling

| | |
|---|---|
| Pittsburgh | 2.15c |
| Chicago, Buffalo | 2.25c |

## Strip and Hoops

Hot strip to 23¾-in.

| | |
|---|---|
| Pittsburgh | 1.85c |
| Chicago, base | 1.95c |
| Birmingham base | 2.00c |
| Detroit, delivered | 2.05c |
| Philadelphia, del. | 2.16c |
| New York, del. | 2.20c |
| Cooperage hoop, Pittsburgh | 1.95c |
| Chicago | 2.05c |
| Cold-rolled strip, Pitts., Cleve. | 2.60c |
| Worcester, Mass. | 2.80c |

## Rails, Track Material

(Gross Tons)

| | |
|---|---|
| Standard rails, mill | $36.37½ |
| Relay rails, Pitts. 24-45 lbs. | $26.00 |
| 50-60 lbs. | $23.00 |
| 70-75 lbs. | $20.00 |
| 80-85 lbs. | $24.00 |
| 100 lbs. | $25.00 |
| Light rails, billet qual. Pitts., Chi. | $35.00 |
| Do., reroll. qual. | 34.00 |
| Angle bars, billet, Gary, Ind., So. Chi. | 2.55c |
| Do., axle steel | 2.10c |
| Spikes, R. R. base | 2.40c |
| Track bolts, base | 3.55c |
| Tie plates, base | 1.90c |

Base, light rails 25 to 40 lbs.; 50 to 60 lbs. inclusive up $5; 16 and 20 lbs., up $1; 12 lbs. up $8; 8 and 10 lbs., up $5. Base railroad spikes 200 kegs or more; base tie plates 20 tons.

## Bolts and Nuts

Pittsburgh, Cleveland, Birmingham, Chicago. Discounts to legitimate trade for all case lots, Dec. 1, 1932, lists, 10% extra for less full containers.

**Carriage Bolts**

| | |
|---|---|
| All sizes, cut thread | 70-10-5 off |
| Rolled thread, ½ x 6, smaller | 70-10-5 off |

**Machine Bolts**

| | |
|---|---|
| All sizes cut thread lag screws, plow bolts, Nos. 1-2-3-7 heads, tap bolts, blank bolts stud bolts | 70-10-5 off |
| Tire bolts | 60-5 off |
| Stove bolts, 75 off in pkgs.; 83 off on 15,000 of 3-inch and shorter, or 5000 over 3-inch. | |
| Rolled thread machine, ½ x 6, smaller | 70-10-5 off |
| Step bolts | 70-5 off |
| Elevator bolts | 70-5 off |

**Nuts**

| | |
|---|---|
| S.A.E. semifinished hex.; ½ to ⅞-inch | 70-10-5 off |
| Do., ½ to 1-inch | 70-10-5 off |
| Do., over 1-inch | 70 off |

**Hexagon Cap Screws**

| | |
|---|---|
| Milled | 85-10 off |
| Upset, 1-in., smaller | 87½ off |

**Square Head Set Screws**

| | |
|---|---|
| Upset, 1-in., smaller | 80 off |
| Headless set screws | 75 off |

## Rivets, Wrought Washers

| | |
|---|---|
| Struc., c. l., Pittsburgh, Cleveland | 2.90c |
| Struc., c. l., Chicago ⅞-in. and smaller, Pitts., Chi., Cleve. | 70 and 5 off |
| Wrought washers, Pitts., Chi., Phila., to jobbers & large nut, bolt mfrs. | $6.25 off |

## Cut Nails

| | |
|---|---|
| Cut nails, Pitts.; (10% discount on size extras) | $2.75 |
| Do. less carloads, 5 kegs or more no discount on size extras | $3.05 |
| Do. under 5 kegs; no discount on size extras | $3.20 |

# Pipe and Tubing

Base $200 net ton, except on standard commercial seamless boiler tubes under 2 inches and cold drawn seamless tubing.

## Welded Iron, Steel Pipe

Base discounts on steel pipe, Pitts., Lorain, O., to consumers in carloads, Gary, Ind., 2 points less. Chicago delivered 2½ points less. Wrought pipe, Pittsburgh base.

**Butt Weld**

Steel

| In. | Blk. | Gal. |
|---|---|---|
| ¼ and ⅜ | 53½ | 35 |
| ½ | 58½ | 47 |
| ¾ | 62 | 52 |
| 1—3 | 64 | 55 |

Iron

| | | |
|---|---|---|
| ½ | 31½ | 15 |
| ¾ | 36½ | 20½ |
| 1—1¼ | 39½ | 25½ |
| 2 | 41½ | 26 |

**Lap Weld**

Steel

| | | |
|---|---|---|
| 2 | 60 | 51 |
| 2½—3 | 63 | 54 |
| 3½—6 | 65 | 56 |
| 7 and 8 | 64 | 54 |
| 9 and 10 | 63½ | 53½ |

Iron

| | | |
|---|---|---|
| 2 | 37 | 22½ |
| 2½—3½ | 38 | 25 |
| 4—8 | 40 | 28½ |

**Line Pipe**

Steel

| | |
|---|---|
| ½, butt weld | 57½ |
| ⅛-inch, butt weld | 50½ |
| ¼—⅜, butt weld | 52½ |
| ¾, butt weld | 61 |
| 1—3, butt weld | 63 |
| 2-inch, lap weld | 59 |
| 2½—3, lap weld | 62 |
| 3½—6, lap weld | 64 |
| 7—8, lap weld | 63 |

Iron

⅛—1½ inch, black and galv. take 4 pts. over; 2½—6 inch 2 pts. over discounts for same sizes, standard pipe lists, 8—12-inch, no extra.

**Boiler Tubes**

*C. L. Discounts, f.o.b. Pitts.*

| *Lap Weld Steel* | | *Charcoal Iron* | |
|---|---|---|---|
| 2—2¼ | 33 | 1¾ | 8 |
| 2½—2¾ | 40 | 2—2¼ | 13 |
| 3 | 47 | 2½—2¾ | 16 |
| 3¼—3½ | 50 | 3 | 17 |
| 4 | 52 | 3¼—3½ | 18 |
| 4½—5 | 42 | 4 | 20 |
| | | 4½ | 21 |

In lots of a carload or more, above discounts subject to preferential of two 5% and one 7½% discount on steel and 10% on charcoal iron.

Lapwelded steel: 200 to 9999 pounds, ten points under base, one 5% and one 7½%. Under 2000 pounds 15 points under base, one 5% and one 7½%. Charcoal iron: 10,000 pounds to carloads, base less 5%; under 10,000 lbs., 2 points under base.

**Seamless Boiler Tubes**

Under date of May 15 in lots of 40,000 pounds or more for cold-drawn boiler tubes and in lots of 40,000 pounds or feet or more for hot-finished boiler tubes, revised prices are quoted for 55 cold-drawn boiler tube sizes ranging from ¼ to 6-inch outside diameter in 30 wall thicknesses, decimal equivalent from 0.035 to 1.000, on a dollars and cents basis per 100 feet and per pound. Less-carloads revised as of July 1, 1935 card.

Hot-finished carbon steel boiler tube prices also under date of May 15 range from 1 through 7 inches outside diameter, inclusive, and embrace 47 size classifications in 22 decimal wall thicknesses ranging from 0.109 to 1.000, prices also being on a lb. and 100 ft. basis.

## Seamless Tubing

*Cold drawn; f.o.b. mill disc.*

| | |
|---|---|
| 100 ft. or 150 lbs. | 32% |
| 15,000 ft. or 22,500 lbs. | 70% |

## Cast Iron Water Pipe

*Class B Pipe—Per Net Ton*

| | |
|---|---|
| 6-in. & over, Birm. | $39.00-40.00 |
| 4-in., Birmingham | 42.00-43.00 |
| 4-in., Chicago | 50.40-51.40 |
| 6 to 24-in. Chicago | 47.40-48.40 |
| 6-in. & over, east fdy. | 43.00 |
| Do., 4-in. | 46.00 |

Class A pipe $3 over Class B.

| | |
|---|---|
| Stnd. fitgs., Birm. base | $100.00 |

## Semifinished Steel

**Billets and Blooms**

*4 x 4-inch base; gross ton*

| | |
|---|---|
| Pitts., Chi., Cleve., and Youngstown | $27.00 |
| Philadelphia | 32.67 |
| Duluth | 31.00 |
| Forging, Pitts., Chi. and Buffalo | 32.00 |
| Forging, Duluth | 36.00 |

**Sheet Bars**

| | |
|---|---|
| Pitts., Cleve., Young., Chi., Buff., Canton, Sparrows Pt. | 28.00 |

**Slabs**

| | |
|---|---|
| Pitts., Cleve., Young. | 27.00 |

**Wire Rods**

*(Common; combination up $2)*

| | |
|---|---|
| Pitts., Cleveland | 38.00 |
| Chicago | 39.00 |
| Worcester, Mass. | 40.00 |

**Skelp**

| | |
|---|---|
| Pitts., Chi., Young., Buff., Coatesville, Sparrows Point | 1.70c |

## Coke

*Price Per Net Ton*

**Beehive Ovens**

| | |
|---|---|
| Connellsville, fur. | $3.25- 3.40 |
| Connellsville, fdry. | 4.00- 4.10 |
| Connel. prem. fdry. | 5.00- 5.10 |
| New River fdry. | 6.00 |
| Wise county fdry. | 4.45- 5.00 |
| Wise county fur. | 4.00- 4.50 |

**By-Product Foundry**

| | |
|---|---|
| Newark, N. J., del. | 9 20 9.65 |
| Chi., ov., outside del. | 8.50 |
| Chicago, del. | 9.25 |
| New England, del. | 11.00 |
| St. Louis, del. | 9.25 |
| Birmingham, ovens | 6.00 |
| Indianapolis, del. | 8.75 |
| Cincinnati, del. | 9.30 |
| Cleveland, del. | 9.25 |
| Buffalo, ovens | 7 50- 8.00 |
| Detroit ov., out. del. | 8.50 |
| Philadelphia, del. | 9.03 |

## Coke By-Products

Per gallon, producers' plants.

| Tank lots | Spot |
|---|---|
| Pure and 90% benzol | 15.00c |
| Toluol | 30.00c |
| Solvent naphtha | 30.00c |
| Commercial xylol | 30.00c |

Per lb. f.o.b. New York.

| | |
|---|---|
| Phenol (200 lb. drums) | 16.30c |
| Do. (100 lbs.) | 17.30c |

Eastern Plants, per lb.

| | |
|---|---|
| Naphthalene flakes and balls, in bbls., to jobbers | 4.50c |

Per 100 lb. Atlantic seaboard

| | |
|---|---|
| Sulphate of ammonia | $1.20 |

†Western prices, ½-cent up.

## Pig Iron

Delivered prices include switching charges only as noted. No. 2 foundry is 1.75-2.25 sil.; 25c diff. for each 0.25 sil. above 2.25; 50c diff. for each 0.25 below 1.75. Gross tons.

| Basing Points: | No. 2 Fdry. | Malleable | Basic | Bessemer |
|---|---|---|---|---|
| Bethlehem, Pa. | $19.50 | $20.00 | $19.00 | $20.50 |
| Birdsboro, Pa. | 19.50 | 20.00 | 19.00 | 20.50 |
| Birmingham, Ala., southern del. | 14.50 | 14.50 | 13.50 | 19.00 |
| Buffalo | 18.50 | 19.00 | 17.50 | 19.50 |
| Chicago | 18.50 | 18.50 | 18.00 | 19.00 |
| Cleveland | 18.50 | 18.50 | 18.00 | 19.00 |
| Detroit | 18.50 | 18.50 | 18.00 | 19.00 |
| Duluth | 19.00 | 19.00 | ..... | 19.50 |
| Erie, Pa. | 18.50 | 19.00 | 18.00 | 19.50 |
| Everett, Mass. | 19.50 | 20.00 | 19.00 | 20.50 |
| Hamilton, O. | 18.50 | 18.50 | 18.00 | 19.00 |
| Jackson, O. | 20.25 | 20.25 | 19.75 | ..... |
| Neville Island, Pa. | 18.50 | 18.50 | 18.00 | 19.00 |
| Provo, Utah | 17.50 | ..... | 17.00 | ..... |
| Sharpsville, Pa. | 18.50 | 18.50 | 18.00 | 19.00 |
| Sparrows Point, Md. | 19.50 | ..... | 19.00 | ..... |
| Swedeland, Pa. | 19.50 | 20.00 | 19.00 | 20.50 |
| Toledo, O. | 18.50 | 18.50 | 18.00 | 19.00 |
| Youngstown, O. | 18.50 | 18.50 | 18.00 | 19.00 |
| **Delivered from Basing Points:** | | | | |
| Akron, O., from Cleveland | 19.76 | 19.76 | 19.26 | 20.26 |
| Baltimore from Birmingham | 20.08 | ..... | 18.96 | ..... |
| Boston from Birmingham | 19.62 | ..... | 19.50 | ..... |
| Boston from Everett, Mass. | 20.00 | 20.50 | 19.50 | 21.00 |
| Boston from Buffalo | 20.00 | 20.50 | 19.50 | 21.00 |
| Brooklyn, N. Y., from Bethlehem | 21.93 | 22.43 | ..... | ..... |
| Brooklyn, N. Y., from Bmghm. | 21.55 | ..... | ..... | ..... |
| Canton, O., from Cleveland | 19.76 | 19.76 | 19.26 | 20.26 |
| Chicago from Birmingham | †18.72 | ..... | 18.60 | ..... |
| Cincinnati from Hamilton, O. | 19.51 | 19.51 | 19.01 | ..... |
| Cincinnati from Birmingham | 19.38 | ..... | 19.40 | ..... |
| Cleveland from Birmingham | 19.04 | ..... | 18.92 | ..... |
| Indianapolis from Hamilton, O. | 20.93 | 20.93 | 20.43 | 21.43 |
| Mansfield, O., from Toledo, O. | 20.26 | 20.26 | 19.76 | 20.76 |
| Milwaukee from Chicago | 19.57 | 19.57 | 19.07 | 20.07 |
| Muskegon, Mich., from Chicago, Toledo or Detroit | 21.60 | 21.60 | 21.10 | 22.10 |
| Newark, N. J., from Birmingham | 20.61 | ..... | ..... | ..... |
| Newark, N. J., from Bethlehem | 20.99 | 21.49 | ..... | ..... |
| Philadelphia from Birmingham | 19.93 | ..... | 19.1 | ..... |
| Philadelphia from Swedeland, Pa. | 20.31 | 20.81 | 19.81 | ..... |
| Pittsburgh district from Neville Island | Neville base plus 67c, 81c and $1.21 switching charges | | | |
| Saginaw, Mich., from Detroit | 20.75 | 20.75 | 20.25 | 20.25 |

| Delivered from Basing Points: | No. 2 Fdry. | Malleable | Basic | Bessemer |
|---|---|---|---|---|
| St. Louis, northern | 19.00 | 19.00 | 18.50 | ..... |
| St. Louis from Birmingham | †18.62 | ..... | 18.50 | ..... |
| St. Paul from Duluth | 20.94 | 20.94 | ..... | 21.44 |

†Over 0.70 phos.

**Low Phos**

Basing Points: Birdsboro and Steelton, Pa., and Standish, N. Y., $23.50. Phila. base, standard and copper bearing, $24.63

| Gray Forge | | Charcoal | |
|---|---|---|---|
| Valley furnace | 18.00 | Lake Superior fur. | 21.00 |
| Pitts. dist. fur. | 18.00 | Do., del. Chicago | 24.25 |
| | | Lyle, Tenn. | 21.50 |

**Silvery†**

Jackson County, O., base; 6% $22.75; 7—$23.75; 8—$24.75; 9—$25.70; 10—$26.75; 11—$27.75. Buffalo base prices, up $1.25.

**Bessemer Ferrosilicon†**

Jackson County, O., base; 10%—$27.75; 11—$28.75; 12—$30.25; 13—$31.75; 14—$33.25; 15—$34.75; 16—$36.25. Buffalo base prices $1.25 higher.

†The lower all-rail delivered price from Jackson, O., or Buffalo is quoted with freight allowed.

Manganese differentials in silvery iron and ferrosilicon: 2 to 3%, $1 per ton additional; each unit over 3%, $1 per ton additional.

## Refractories

*Per 1000 f.o.b. Works*

**Fire Clay Brick**

*Super Quality*

| | |
|---|---|
| Pa., Mo., Ky. | $55.00 |

*First Quality.*

| | |
|---|---|
| Pa., Ill., Md., Mo. | $45.00 |
| Alabama, Ga., Ky., | $40.00-45.00 |

*Second Quality*

| | |
|---|---|
| Pa., Ill., Ky., Md., Mo. | 40.00 |
| Ga., Ala. | 35.00 |

*Ohio*

| | |
|---|---|
| First quality | $40.00 |
| Intermediary | 37.00 |
| Second quality | 28.00 |

**Malleable Bung Brick**

| | |
|---|---|
| All bases | 50.00 |

**Silica Brick**

| | |
|---|---|
| Pennsylvania | $45.00 |
| Joliet, E. Chicago | 54.00 |
| Birmingham, Ala. | 52.00 |

**Magnesite**

| | |
|---|---|
| Imported dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) | $45.00 |
| Domestic dead-burned grains, net ton f.o.b. Chester, Pa., and Baltimore bases (bags) | 40.00 |
| Domestic dead-burned gr. net ton f.o.b. Chewelah, Wash. (bulk) | 22.00 |

**Basic Brick**

*Net ton, f.o.b. Baltimore, Plymouth Meeting, Chester, Pa.*

| | |
|---|---|
| Chrome brick | $45.00 |
| Chemically bonded chrome brick | 45.00 |
| Magnesite brick | 65.00 |
| Chemically bonded magnesite brick | 55.00 |

## Fluorspar, 85-5

| | |
|---|---|
| Washed gravel, duty paid, tide, net ton | $18.75-19.00 |
| Washed gravel, f.o.b. Ill., Ky., net ton, carloads | $14.50 |

## Ferroalloys

*Dollars, except Ferrochrome*

| | |
|---|---|
| Ferromanganese, 78-82% tidewater, duty paid | 85.00 |
| Do., Balti. base | 85.00 |
| Do., del. Pittsburgh | 90.13 |
| Spiegeleisen, 19-20% dom. Palmerton, Pa., spot† | 26.00 |
| Do., New Orleans | 26.00 |
| Ferrosilicon, 50% freight all., cl. | 77.50 |
| Do., less carload | 85.00 |
| Do., 75 per cent | 126-130.00 |
| Spot, $5 a ton higher. | |
| Silicomang., 2½ carb. | 90.00 |
| 2% carbon, 95.00; 1%, | 105.00 |
| Ferrochrome, 66-70 chromium, 4-6 carbon, cts. lb. del. | 10.00 |
| Ferrotungsten, stand., lb. cont. del. | 1.35- 1.45 |
| Ferrovanadium, 35 to 40% lb., cont. | 2.70- 2.90 |
| Ferrotitanium, c. l., prod. plant, frt. allow., net ton | 137.50 |
| Spot, 1 ton, frt. allow., lb. | 7.00 |
| do., under 1 ton | 7.50 |
| Ferrophosphorus, per ton, c. l., 17-19% Rockdale, Tenn., basis, 18%, $2 unitage | 50.00 |
| Ferrophosphorus, electrolytic, per ton c. l., 23-26% f.o.b. Anniston, Ala., 24% $2.75 unitage | 65.00 |
| Ferromolybdenum, stand. 55-65%, lb. | 0.95 |
| Molybdate, lb. cont. | 0.80 |

†Carloads, Quan. diff. apply.

# Nonferrous

## METAL PRICES OF THE WEEK

*Spot unless otherwise specified. Cents per pound*

| | Copper: Electro, del. Conn. | Copper: Lake, del. Midwest | Copper: Casting, refinery | Straits Tin: New York Spot | Straits Tin: New York Futures | Lead N. Y. | Lead East St. L. | Zinc St. L. | Aluminum 99% | Antimony Chinese Spot, N. Y. | Nickel Cathodes |
|---|---|---|---|---|---|---|---|---|---|---|---|
| July 27 | 8.00 | 8.12½ | 7.50 | 52.75 | 51.00 | 4.15 | 4.00 | 4.40 | *19.00 | 12.75 | 35.00 |
| July 29 | 8.00 | 8.12½ | 7.50 | 52.70 | 51.10 | 4.15 | 4.00 | 4.40 | *19.00 | 12.75 | 35.00 |
| July 30 | 8.00 | 8.12½ | 7.50 | 52.70 | 51.12½ | 4.15 | 4.00 | 4.40 | *19.00 | 12.75 | 35.00 |
| July 31 | 8.00 | 8.12½ | 7.50 | 52.65 | 51.10 | 4.15 | 4.00 | 4.40 | *19.00 | 12.75 | 35.00 |
| Aug. 1 | 8.00 | 8.12½ | 7.50 | 52.65 | 51.12½ | 4.15 | 4.00 | 4.40 | *19.00 | 12.75 | 35.00 |
| Aug. 2 | 8.00 | 8.12½ | 7.50 | 52.55 | 51.05 | 4.20 | 4.05 | 4.50 | *19.00 | 13.00 | 35.00 |

*Nominal range 19.00 to 21.00c.

### MILL PRODUCTS

*F.o.b. mill base, cents per lb. except as specified. Copper brass products based on* 9.00c *Conn. copper.*

| | |
|---|---|
| **Sheets** | |
| Yellow brass (high) | 13.62½ |
| Copper, hot rolled | 15.00 |
| Lead, cut to jobbers | 7.75 |
| Zinc, 100-lb. base | 9.50 |
| **Tubes** | |
| High yellow brass | 15.37½ |
| Seamless copper | 15.25 |
| **Rods** | |
| High yellow brass | 12.12½ |
| Copper, hot rolled | 12.25 |
| **Anodes** | |
| Copper untrimmed | 12.75 |
| **Wire** | |
| Yellow brass (high) | 14.12½ |

### OLD METALS

*Dcal. buying prices, cents lb.*

| | |
|---|---|
| **No. 1 Composition Red Brass** | |
| New York | 4.50- 4.75 |
| Cleveland | 5.00- 5.25 |
| Chicago | 4.50- 4.75 |
| St. Louis | 4.50- 4.75 |
| **Heavy Copper and Wire** | |
| *New York, No. 1 | 5.75- 6.00 |
| Chicago, No. 1 | 5.75 6.00 |
| *Cleveland | 5.50- 5.75 |
| St. Louis, No. 1 | 6.00- 6.25 |
| **Composition Brass Borings** | |
| New York | 4.00- 4.25 |
| **Light Copper** | |
| *New York | 4.75- 5.00 |
| Chicago | 4.12½-4.37½ |
| Cleveland | 4.75- 5.00 |
| St. Louis | 4.75- 5.00 |
| **Light Brass** | |
| Chicago | 2.25- 2.50 |
| Cleveland | 2.50- 2.75 |
| St. Louis | 2.25- 2.50 |
| **Lead** | |
| New York | 3.12½- 3.25 |
| Cleveland | 3.00- 3.25 |
| Chicago | 2.87½-3.12½ |
| St. Louis | 3.25- 3.40 |
| **Zinc** | |
| New York | 2.00- 2.25 |
| Cleveland | 2.00- 2.25 |
| St. Louis | 2.50- 2.65 |
| **Aluminum** | |
| Borings, Cleveland | 7.50- 8.00 |
| *Mixed, cast, Clev. | 12.00-12.25 |
| Mixed, cast, St. L. | 11.75-12.00 |
| Clips, soft, Cleve. | 13.50-14.00 |
| **SECONDARY METALS** | |
| Brass ingot, 85-5-5-5 | 8.00 |
| *Stand. No. 12 alum. | 16.25 |

# Iron and Steel Scrap Prices

*Corrected to Friday night. Gross tons delivered to consumers, except where otherwise stated*

**HEAVY MELTING STEEL**

| | |
|---|---|
| Birmingham | 8.50- 9.00 |
| Boston, dock, expt. | 8.50 |
| Boston, domestic | 7.00- 7.25 |
| Buffalo, No. 1 | 10.75-11.25 |
| Buffalo, No. 2 | 9.75-10.25 |
| Chicago, No. 1 | 11.50-12.00 |
| Cleveland, No. 1 | 11.75-12.25 |
| Cleveland, No. 2 | 11.00-11.50 |
| Detroit, No. 1 | 9.25- 9.75 |
| Detroit, No. 2 | 7.75- 8.25 |
| Eastern Pa., No. 1 | 10.50-11.00 |
| Eastern Pa., No. 2 | 9.50-10.00 |
| Federal, Ill. | 8.50- 9.00 |
| Granite City, R. R. | 8.25- 8.75 |
| Granite City, No. 2 | 7.25- 7.75 |
| N. Y., deal, No. 2 | 7.50 |
| N. Y., deal. barge | 8.50 |
| Pittsburgh, No. 1 | 13.00-13.50 |
| Pittsburgh, No. 2 | 11.25-11.75 |
| St. Louis | 7.50- 8.00 |
| Valleys, No. 1 | 12.75-13.25 |

**COMPRESSED SHEETS**

| | |
|---|---|
| Buffalo, dealers | 9.75-10.25 |
| Chicago, factory | 10.25-10.75 |
| Chicago, dealer | 9.00- 9.50 |
| Cleveland | 11.00-11.50 |
| Detroit | 9.75-10.25 |
| E. Pa., new mat. | 10.00-10.50 |
| Pittsburgh | 13.00-13.50 |
| St. Louis | 6.25- 6.75 |
| Valleys | 12.50 |

**BUNDLED SHEETS**

| | |
|---|---|
| Buffalo | 7.25- 7.75 |
| Cincinnati, del. | 6.50- 7.00 |
| Cleveland | 9.50-10.00 |
| Pittsburgh | 11.00-11.50 |
| St. Louis | 4.50- 5.00 |

**SHEET CLIPPINGS, LOOSE**

| | |
|---|---|
| Chicago | 7.00- 7.50 |
| Cincinnati | 6.00- 6.50 |
| Detroit | 5.00- 5.50 |
| St. Louis | 4.75- 5.25 |

**STEEL RAILS, SHORT**

| | |
|---|---|
| Birmingham | 12.00-12.50 |
| Buffalo | 13.00-13.50 |
| Chicago (3 ft.) | 13.50-14.00 |
| Chicago (2 ft.) | 14.00-14.50 |
| Cincinnati del | 11.50-12.00 |
| Detroit | 11.50-12.00 |
| Pitts., open-hearth, 3 ft. and less | 15.00-15.50 |
| St. Louis, 2 ft.& less | 12.00-12.50 |

**STEEL RAILS, SCRAP**

| | |
|---|---|
| Boston | 7.50- 8.00 |
| Chicago | 11.50-12.00 |
| Pittsburgh | 13.25-13.75 |
| St. Louis | 10.25-10.75 |

**STOVE PLATE**

| | |
|---|---|
| Birmingham | 5.75- 6.00 |
| Boston, dealers | 3.50- 3.75 |
| Buffalo | 9.50-10.00 |
| Chicago, net | 7.00- 7.50 |
| Cincinnati, dealers | 6.00- 6.50 |
| Detroit, net | 6.50- 700 |
| Eastern Pa. | 8.50 |
| N. Y., deal. fdry. | 6.00 |
| St. Louis | 5.50- 6.00 |

**COUPLERS, SPRINGS**

| | |
|---|---|
| Buffalo | 12.75-13.25 |
| Chicago, springs | 12.50-13.00 |
| Eastern Pa. | 13.50 |
| Pittsburgh | 15.00-15.50 |
| St. Louis | 10.50-11.00 |

**ANGLE BARS—STEEL**

| | |
|---|---|
| Chicago | 13.00-13.50 |
| St. Louis | 10.00-10.50 |

**RAILROAD SPECIALTIES**

| | |
|---|---|
| Chicago | 12.50-13.00 |

**LOW PHOSPHORUS**

| | |
|---|---|
| Buffalo, billets and bloom crops | 12.75-13.25 |
| Cleveland, billet, bloom crops | 14.00-14.50 |
| Eastern Pa., crops | 13.00-14.00 |
| Pittsburgh, billet, bloom crops | 15.50-16.00 |
| Pittsburgh, sheet bar crops | 14.00-14.50 |

**FROGS, SWITCHES**

| | |
|---|---|
| Chicago | 11.50-12.00 |
| St. Louis, cut | 10.25-10.75 |

**SHOVELING STEEL**

| | |
|---|---|
| Chicago | 11.50-12.00 |
| Federal, Ill. | 8.50- 9.00 |
| Granite City, Ill. | 7.25- 7.75 |

**RAILROAD WROUGHT**

| | |
|---|---|
| Birmingham | 8.00- 8.50 |
| Boston, dealers | 6.00- 6.50 |
| Buffalo, No. 1 | 9.75-10.00 |
| Buffalo, No. 2 | 10.75-11.25 |
| Chicago, No. 1, net | 9.00- 9.50 |
| Chicago, No. 2 | 11.50-12.00 |
| Cincinnati, No. 2 | 8.50- 9.00 |
| Eastern Pa. | 11.00-11.50 |
| N. Y., No. 1, deal. | 7.25- 7.75 |
| St. Louis, No. 1 | 6.50- 7.00 |
| St. Louis, No. 2 | 8.50- 9.00 |

**SPECIFICATION PIPE**

| | |
|---|---|
| Boston | 3.00- 3.25 |
| Eastern Pa. | 9.00- 9.50 |
| New York, dealers | 3.50- 4.00 |

**BUSHELING**

| | |
|---|---|
| Buffalo, No. 1 | 9.75-10.25 |
| Chicago, No. 1 | 9.50-10.00 |
| Cinci., No. 1, deal. | 6.50- 7.00 |
| Cincinnati, No. 2 | 3.50- 4.00 |
| Cleveland, No. 2 | 7.00- 7.50 |
| Detroit, No. 1, new | 8.00- 8.50 |
| Valleys, new, No. 1 | 12.00-12.50 |

**MACHINE TURNINGS**

| | |
|---|---|
| Birmingham | 3.50- 4.00 |
| Boston, dealers | 2.25- 2.50 |
| Buffalo | 4.75- 5.25 |
| Chicago | 6.00- 6.50 |
| Cincinnati, dealers | 4.00- 4.50 |
| Cleveland | 6.50- 7.00 |
| Detroit | 4.75- 5.25 |
| Eastern Pa. | 6.00- 6.50 |
| New York, dealers | 3.00- 3.25 |
| Pittsburgh | 8.75- 9.25 |
| St. Louis | 2.25- 2.75 |
| Valleys | 8.50- 9.00 |

**BORINGS AND TURNINGS**

*For Blast Furnace Use*

| | |
|---|---|
| Boston, dealers | 3.25- 3.50 |
| Buffalo | 6.75- 7.00 |
| Cincinnati, dealers | 4.50- 5.00 |
| Cleveland | 7.00- 7.50 |
| Detroit | 5.25- 5.75 |
| Eastern Pa. | 5.00 |
| New York, dealers | 1.50- 1.75 |
| Pittsburgh | 7.00- 8.00 |

**CAST IRON BORINGS**

| | |
|---|---|
| Birmingham, plain | 3.50- 4.00 |
| Boston, chemical | 5.50- 6.50 |
| Boston, dealers | 3.25- 3.50 |
| Buffalo | 6.75- 7.00 |
| Chicago | 6.00- 6.50 |
| Cincinnati, dealers | 4.50- 5.00 |
| Cleveland | 7.00- 7.50 |
| Detroit | 5.25- 5.75 |
| E. Pa., chemical | 11.00-12.00 |
| New York, dealers | 1.50- 1.75 |
| St. Louis | 2.00- 2.50 |

**PIPE AND FLUES**

| | |
|---|---|
| Cincinnati, dealers | 5.00- 5.50 |

**RAILROAD GRATE BARS**

| | |
|---|---|
| Buffalo | 7.50- 8.00 |
| Chicago, net | 6.50- 7.00 |
| Cincinnati | 4.50- 5.00 |
| Eastern Pa. | 8.50 |
| New York, dealers | 4.00- 4.50 |
| St. Louis | 4.50- 5.00 |

**FORGE FLASHINGS**

| | |
|---|---|
| Boston, dealers | 5.25- 5.50 |
| Buffalo | 9.75-10.25 |
| Cleveland | 9.50-10.00 |
| Detroit | 7.50- 8.00 |
| Pittsburgh | 11.00-11.50 |

**FORGE SCRAP**

| | |
|---|---|
| Boston, dealers | 4.50 |
| Chicago, heavy | 12.00-12.50 |
| Eastern Pa. | 10.50-11.00 |

**ARCH BARS, TRANSOMS**

| | |
|---|---|
| St. Louis | 10.00-10.50 |

**AXLE TURNINGS**

| | |
|---|---|
| Boston, dealers | 3.00- 3.50 |
| Buffalo | 7.50- 8.00 |
| Chicago, elec. fur. | 11.00-11.50 |
| Cleveland | 7.00- 7.50 |
| Eastern Pa. | 9.50 |
| St. Louis | 7.00- 7.50 |

**STEEL CAR AXLES**

| | |
|---|---|
| Birmingham | 12.00-12.50 |
| Boston, ship. point. | 10.00-10.50 |
| Buffalo | 12.50-13.00 |
| Chicago, net | 14.00-14.50 |
| Eastern Pa. | 16.00 |
| St. Louis | 12.00-12.50 |

**SHAFTING**

| | |
|---|---|
| Boston, ship. point. | 12.00-12.25 |
| Eastern Pa. | 17.50 |
| New York, dealers | 13.25-13.50 |
| St. Louis | 11.00-11.50 |

**CAR WHEELS**

| | |
|---|---|
| Birmingham | 9.00-10.00 |
| Boston, iron deal. | 5.50- 5.75 |
| Buffalo, iron | 11.00-11.50 |
| Buffalo, steel | 12.75-13.25 |
| Chicago, iron | 12.00-12.50 |
| Chicago, rolled steel | 12.50-13.00 |
| Cincinnati, iron | 8.50- 9.00 |
| Eastern Pa., iron | 11.00 |
| Eastern Pa., steel | 13.50 |
| Pittsburgh, iron | 13.00-13.50 |
| Pittsburgh, steel | 15.00-15.50 |
| St. Louis, iron | 8.50- 9.00 |
| St. Louis, steel | 11.50-12.00 |

**NO. 1 CAST SCRAP**

| | |
|---|---|
| Birmingham | 8.50- 9.50 |
| Boston, No. 1 mach. | 8.50- 9.00 |
| Boston, No. 2 | 7.50- 8.00 |
| Boston, tex. con. | 8.50- 9.00 |
| Buffalo, cupola | 10.50-11.00 |
| Buffalo, mach. | 11.50-12.00 |
| Chicago, agri. net | 8.50- 9.00 |
| Chicago, auto | 10.00-10.50 |
| Chicago, mach. net | 10.00-10.50 |
| Chicago, railr'd net | 9.50-10.00 |
| Cinci., mach. cup | 9.00- 9.50 |
| Cleveland, cupola | 11.75-12.25 |
| Detroit, net | 10.00-10.50 |
| Eastern Pa., cupola | 11.00-12.00 |
| E. Pa., mixed yard | 9.00- 9.50 |
| Pittsburgh, cupola | 13.50-14.00 |
| San Francisco, del. | 13.50-14.00 |
| Seattle | 7.00- 8.50 |
| St. Louis, No. 1 | 8.00- 8.50 |
| St. L., No. 1 mach. | 9.00- 9.50 |

**HEAVY CAST**

| | |
|---|---|
| Boston, del. | 5.25- 5.50 |
| Buffalo, break. | 8.50- 9.00 |
| Cleveland, break. | 10.00 |
| Detroit, No. 1, mach. net | 10.25-10.75 |
| Detroit, break. | 8.50- 9.00 |
| Detroit, auto net | 10.50-11.00 |
| Eastern Pa. | 10.50 |
| N. Y., break. deal. | 6.25- 6.50 |
| Pittsburgh | 12.00-12.50 |

**MALLEABLE**

| | |
|---|---|
| Birmingham, R. R. | 10.50-11.00 |
| Boston, consum. | 12.00-12.50 |
| Buffalo | 13.00-13.50 |
| Chicago, R. R. | 13.50-14.00 |
| Cincinnati, agri. del. | 9.00- 9.50 |
| Cleveland, rail | 14.50-15.00 |
| Detroit, auto | 11.00-11.50 |
| St. Louis, R. R. | 10.75-11.25 |
| Eastern Pa., R. R. | 11.00-11.50 |

**RAILS FOR ROLLING**

*5 feet and over*

| | |
|---|---|
| Birmingham | 10.50-11.00 |
| Boston, dealers | 8.00- 8.50 |
| Buffalo | 11.00-11.50 |
| Chicago | 13.00-13.50 |
| Eastern Pa. | 12.50-13.00 |
| New York, dealer | 8.50- 9.00 |
| St. Louis | 11.00-11.50 |

**LOCOMOTIVE TIRES**

| | |
|---|---|
| Chicago (cut) | 12.50-13.00 |
| St. Louis, No. 1 | 9.00- 9.50 |

**LOW PHOS. PUNCHINGS**

| | |
|---|---|
| Buffalo | 12.50-13.00 |
| Chicago | 14.00-14.50 |
| Eastern Pa. | 13.00-14.00 |
| Pittsburgh (heavy) | 14.50-15.00 |
| Pittsburgh (light) | 14.00-14.50 |

## Iron Ore

**Lake Superior Ore**

*Gross ton, 51½% Lower Lake Ports*

| | |
|---|---|
| Old range bessemer | $4.80 |
| Mesabi nonbess. | 4.50 |
| High phosphorus | 4.40 |
| Mesabi bessemer | 4.65 |
| Old range nonbess. | 4.65 |

**Eastern Local Ores**

*Cents, unit, del. E. Pa.*

| | |
|---|---|
| Foundry and basic 56-63% con. (nom.) | 8.00- 9.00 |
| Cop.-free low phos. 58-60% (nom.) | 10.00-10.50 |

**Foreign Ore**

*Cents per unit, f.a.s. Atlantic ports (nominal)*

| | |
|---|---|
| Foreign manganiferous ore, 45.55% iron, 6-10% man. | 10.00 |
| No. Afr. low phos. | 10.00-10.50 |
| Swedish basic, 65% | 9.00 |
| Swedish low phos. | 10.00 |
| Spanish No. Africa basic, 50 to 60% | 9.50 |
| Tungsten, spot sh. ton unit, duty pd. | $15.50-16.00 |
| N. F. fdy., 55% | 7.00 |
| Chrome ore, 48% gross ton, c.i.f. | $18.00-19.00 |

## Manganese Ore

*(Nominal)*

Prices not including duty, cents per unit cargo lots.

| | |
|---|---|
| Caucasian, 52-55% | 26.00 |
| So. African, 52% | 26.00 |
| So. Afr., 49-51% | 24.00 |
| Indian, 58-60% | nominal |
| Indian, 48-50% | nominal |

# Warehouse Iron and Steel Prices

*Cents per pound for delivery within metropolitan districts of cities specified*

| | |
|---|---|
| **STEEL BARS** | |
| Baltimore* | 2.95c |
| Boston†† | 3.00c |
| Buffalo | 3.00c |
| Chattanooga | 3.31c |
| Chicago | 2.95c |
| Cincinnati | 3.17c |
| Cleveland | 2.95c |
| Detroit | 3.04c |
| Houston | 3.00c |
| Los Angeles | 3.60c |
| Milwaukee | 3.06c |
| New Orleans | 3.30c |
| New York‡(d) | 3.26c |
| Pittsburgh (h) | 2.90c |
| Philadelphia* | 2.93c |
| San Francisco | 3.60c |
| Seattle | 3.60c |
| St. Louis | 3.20c |
| St. Paul | 3.00c |
| Tulsa | 3.25c |
| **IRON BARS** | |
| Portland | 3.40c |
| Chattanooga | 3.31c |
| Baltimore* | 3.05c |
| Chicago | 2.75c |
| Cincinnati | 3.17c |
| New York‡(d) | 3.36c |
| Philadelphia* | 2.93c |
| St. Louis | 3.20c |
| Tulsa | 3.25c |
| **REINFORCING BARS** | |
| Buffalo | 2.60c |
| Chattanooga | 3.31c |
| Chicago | 2.10c-2.60c |
| Cleveland (c) | 2.10c |
| Cincinnati | 3.25c |
| Houston | 3.25c |
| Los Ang., cl. | 2.45c |
| New Orleans | 3.50c |
| Pitts., plain (h) | 3.05c |
| Pitts., twisted squares (h) | 3.175c |
| San Francisco | 2.45c |
| Seattle | 2.45c |
| St. Louis | 3.25c |
| Tulsa | 3.25c |
| Young. | 2.30c-2.60c |
| **SHAPES** | |
| Baltimore* | 3.00c |
| Boston†† | 3.19c |
| Buffalo | 3.25c |
| Chattanooga | 3.56c |
| Chicago | 3.20c |
| Cincinnati | 3.42c |
| Cleveland | 3.31c |
| Detroit | 3.42c |
| Houston | 3.00c |
| Los Angeles | 3.60c |
| Milwaukee | 3.31c |
| New Orleans | 3.55c |
| New York(d) | 3.37c |
| Philadelphia* | 2.98c |
| Pittsburgh(h) | 3.15c |
| Portland | 3.55c |
| San Francisco | 3.55c |
| Seattle | 3.55c |
| St. Louis | 3.45c |
| St. Paul | 3.25c |
| Tulsa | 3.50c |
| **PLATES** | |
| Baltimore* | 3.00c |
| Boston†† | 3.21c |
| Buffalo | 3.37c |
| Chattanooga | 3.56c |
| Chicago | 3.20c |
| Cincinnati | 3.42c |
| Cleveland, ¼-in. and over | 3.31c |
| Detroit | 3.42c |
| Detroit, ⅜-in. | 3.65 c |
| Houston | 3.00c |
| Los Angeles | 3.60c |
| Milwaukee | 3.31c |
| New Orleans | 3.55c |
| New York(d) | 3.40c |
| Philadelphia* | 2.98c |
| Phila. floor | 4.95c |
| Pittsburgh(h) | 3.15c |
| Portland | 3.55c |
| San Francisco | 3.55c |
| Seattle | 3.55c |
| St. Louis | 3.45c |
| St. Paul | 3.25c |
| Tulsa | 3.50c |
| **NO. 10 BLUE** | |
| Baltimore* | 3.10c |
| Boston†† | 3.30c |
| Buffalo | 3.62c |
| Chattanooga | 3.36c |
| Chicago | 3.05c |
| Cincinnati | 3.22c |
| Cleveland | 3.11c |
| Det., 8-10 ga. | 3.14c |
| Houston | 3.35c |
| Los Angeles | 3.70c |
| Milwaukee | 3.16c |
| New Orleans | 3.55c |
| New York | 3.31c |
| Portland | 3.75c |
| Philadelphia* | 3.08c |
| Pittsburgh(h) | 2.95c |
| San Francisco | 3.75c |
| Seattle | 3.75c |
| St. Louis | 3.45c |
| St. Paul | 3.45c |
| Tulsa | 3.70c |
| **NO. 24 BLACK** | |
| Baltimore*† | 3.60c |
| Boston (g) | 3.95c |
| Buffalo | 3.25c |
| Chattanooga | 4.21c |
| Chicago | 3.85c |
| Cincinnati | 4.07c |
| Cleveland | 3.91c |
| Detroit | 3.94c |
| Los Angeles | 4.35c |
| Milwaukee | 3.96c |
| New York | 3.89c |
| Philadelphia*† | 3.60c |
| Pitts.** (h) | 3.55c |
| Portland | 4.40c |
| San Francisco | 4.40c |
| Seattle | 4.40c |
| St. Louis | 4.10c |
| St. Paul | 3.695c |
| Tulsa | 4.75c |
| **NO. 24 GALV. SHEETS** | |
| Baltimore*† | 4.30c |
| Buffalo | 4.00c |
| Boston (g) | 4.65c |
| Chattanooga | 4.86c |
| Chicago (h) | 4.55c |
| Cincinnati | 4.72c |
| Cleveland | 4.61c |
| Detroit | 4.72c |
| Houston | 4.40c |
| Los Angeles | 4.95c |
| Milwaukee | 4.66c |
| New Orleans | 4.50c |
| New York | 4.50c |
| Philadelphia*† | 4.30c |
| Pitts** (h) | 4.15-4.45c |
| Portland | 5.00c |
| San Francisco | 5.00c |
| Seattle | 5.00c |
| St. Louis | 4.65c |
| St. Paul | 4.19c |
| Tulsa | 5.10c |
| **BANDS** | |
| Baltimore* | 3.20c |
| Boston†† | 3.30c |
| Buffalo | 3.42c |
| Chattanooga | 3.61c |
| Chicago | 3.30c |
| Cincinnati | 3.47c |
| Cleveland | 3.36c |
| Detroit, ⅜-in. and lighter | 3.39c |
| Houston | 3.25c |
| Los Angeles | 4.10c |
| Milwaukee | 3.41c |
| New Orleans | 3.95c |
| New York(d) | 3.56c |
| Philadelphia | 3 18c |
| Pittsburgh (h) | 3.20c |
| Portland | 4.25c |
| San Francisco | 4.25c |
| Seattle | 4.25c |
| St. Louis | 3.55c |
| St. Paul | 3.20c |
| Tulsa | 3.45c |
| **HOOPS** | |
| Baltimore | 2.30c |
| Boston | 4.30c |
| Buffalo | 3.42c |
| Chicago | 3.30c |
| Cincinnati | 3.47c |
| Det., No. 14 and lighter | 3.39c |
| Los Angeles | 5.85c |
| Milwaukee | 3.41c |
| New York | 3.56c |
| Philadelphia | 3.43c |
| Pittsburgh(h) | 3.70c |
| Portland | 5.60c |
| San Francisco | 6.15c |
| Seattle | 5.60c |
| St. Louis | 3.55c |
| St. Paul | 3.75c |
| **COLD FIN. STEEL** | |
| Baltimore (c) | 3.58c |
| Boston | 3.75c-3.90c |
| Buffalo (h) | 3.40c |
| Chattanooga* | 3.98c |
| Chicago (h) | 3.35c |
| Cincinnati | 3.57c |
| Cleveland (h) | 3.35c |
| Detroit | 3.49c |
| Los Ang.(f) (d) | 5.85c |
| Milwaukee | 3.46c |
| New Orleans | 4.15c |
| New York | 3.81c-4.31c |
| Philadelphia | 3.61c |
| Pittsburgh | 3.20c |
| Portland (f) (d) | 6.00c |
| San Fran.(f) (d) | 5.95c |
| Seattle (f) (d) | 6.00c |
| St. Louis | 3.60c |
| St. Paul | 3.05c |
| Tulsa | 4.50c |
| **COLD ROLLED STRIP** | |
| Boston, 0.100-in., 500 lb. lots | 5.35c |
| Buffalo | 3.39c |
| Chicago | 3.27c |
| Cincinnati (b) | 3.44c |
| Cleveland (b) | 3.20c |
| Detroit | 3.33c |
| New York | 3.36c |
| St. Louis | 3.45c |
| **TOOL STEELS** | |
| (Applying on or east of Mississippi river; west of Mississippi 1c up) | Base |
| High speed | 57c |
| High carbon, high chrome | 37c |
| Oil hardening | 22c |
| Special tool | 20c |
| Extra tool | 17c |
| Regular tool | 14c |
| Uniform extras apply | |
| **BOLTS AND NUTS** | |
| (100 pounds or over) | Discount |
| Chicago (a) | 70 |
| Cleveland | 70 |
| Detroit | 70–5 |
| Milwaukee | 70 |
| Pittsburgh | 70 |

(a) Under 100 pounds, 65 off.

(b) Plus straightening, cutting and quantity differentials; (c) Plus mill, size and quantity extras; (d) Minus quant. diff.; (e) New mill classif.; (f) Rounds only; (g) 50 bundles or over; (h) Outside delivery, 10c less.

‡Domestic bars; *Plus quan. extras; **Under 25 bundles; *†50 or more bundles; †New extras apply; ††Base 40,000 lbs., extras on less.

Prices on heavier lines are subject to new quantity differentials; 399 lbs. and less, up 50 cts.; 400 to 9999 lbs., base; 10,000 to 19,999 lbs., 15 cts. under; 20,000 to 39,999 lbs., 25 cts. under; 40,000 lbs. and over, 35 cts. under base

# Current Iron and Steel Prices of Europe

**Dollars at Rates of Exchange, August 1**

Export Prices f. o. b. Ship at Port of Dispatch—By Cable (or Radio)

| | British gross tons U. K. ports | | Continental Channel or North Sea ports, metric tons | |
|---|---|---|---|---|
| | | £ s d | Quoted in dollars at current value | **Quoted in gold pounds sterling £ s d |
| **PIG IRON** | | | | |
| Foundry, 2.50-3.00 Silicon | $15.50 | 3 2 6 | $13.72 | 1 14 0 |
| Basic bessemer | 15.50 | 3 2 6* | 12.91 | 1 12 0 |
| Hematite, Phos. .03-.05 | 16.35 | 3 5 6 | ..... | ..... |
| **SEMIFINISHED STEEL** | | | | |
| Billets | $27.28 | 5 10 0 | $18.98 | 2 7 0 |
| Wire rods, No. 5 gage | 42.16 | 8 10 0 | 36.38 | 4 10 0 |
| **FINISHED STEEL** | | | | |
| Standard rails | $38.44 | 7 15 0 | $36.34 | 5 10 0 |
| Merchant bars | 1.66c | 7 10 0 | 1.14c to 1.19c | 3 2 6 to 3 5 0 |
| Structural shapes | 1.63c | 7 7 6 | 1.12c | 3 1 6 |
| Plates, †¼ in. or 5 mm. | 1.77c | 8 0 0 | 1.54c | 4 5 0 |
| Sheets, black, 24 gage or 0.5 mm. | 2.04c | 9 5 0 | 2.12c | 5 16 0†† |
| Sheets, gal., 24 gage, corr. | 2.40c | 11 5 0 | 3.19c | 8 15 0 |
| Bands and strips | 1.88c | 8 10 0 | 1.45c | 4 0 0 |
| Plain wire, base | 2.04c | 9 5 0 | 1.85c | 5 7 6 |
| Galvanized wire, base | 2.38c | 10 15 0 | 2.28c to 2.32c | 6 5 6 to 6 7 6 |
| Wire nails, base | 2.65c | 12 0 0 | 2.10c | 5 15 0 |
| Tin plate, box 108 lbs. | $ 4 46 | 0 18 2 | ..... | ..... |

British ferromanganese $85 delivered Atlantic seaboard, duty-paid. German ferromanganese £9 0s 0d $(43.74) f.o.b.

## Domestic Prices at Works or Furnace—Last Reported

| | | £ s d | | French Francs | | Belgian Francs | | Reich Marks |
|---|---|---|---|---|---|---|---|---|
| Bdy. pig iron, Si. 2.5 | $16.74 | 3 7 6(a) | $17.24 | 260 | $12.51 | 370 | $25.44 | 63 |
| Basic bessemer pig iron | 17.36 | 3 10 0(a)* | 12.55 | 190 | 11.15 | 330 | 28.06 (b) | 69.50 |
| Furnace coke | 4 09 | 0 16 6 | 7.96 | 120 | 3.72 | 110 | 7.67 | 19 |
| Billets | 27.28 | 5 10 0 | 28.53 | 430 | 18.25 | 540 | 38.97 | 96.50 |
| Standard rails | 1.82c | 8 5 0 | 2.09c | 694 | 1.65c | 1,100 | 2.42c | 132 |
| Merchant bars | 1.90c | 8 12 0 | 1.68c | 560 | .90c | 600 | 2.01c | 110 |
| Structural shapes | 1.93c | 8 15 0 | 1.65c | 550 | .90c | 600 | 1.97c | 107.50 |
| Plates, †¼-in. or 5 mm. | 2.00c | 9 1 3 | 2.30c | 700 | 1.05c | 700 | 2.32c | 127 |
| Sheets, black | 2.32c | 11 0 0§ | 1.86c | 620‡ | 1.24c | 825‡ | 2.64c | 144‡ |
| Sheets, galv., corr., 24 ga. or 0.5 mm. | 2.87c | 13 0 0 | 3.45c | 1,150 | 2.25c | 1,500 | 6.77c | 370 |
| Plain wire | 2.04c | 9 5 0 | 3.39c | 1,130 | 1.73c | 1,150 | 3.17c | 173 |
| Bands and strips | 2.07c | 9 7 0 | 1.95c | 650 | 1.26c | 840 | 2.32c | 127 |

*Basic. †British ship-plates. Continental, bridge plates. §24 ga. ‡1 to 3 mm. basic price British quotations are for basic open-hearth steel. Continental usually for basic-bessemer steel a del. Middlesbrough. b hematite. ††Close annealed

**Gold pound sterling carries a premium of 65.6 per cent over paper sterling.

# Bars

**Bar Prices, Page 70**

**Philadelphia**—Proposed revisions in steel bar extras, to become effective Aug. 10, are expected to stimulate buying by general users over the next fortnight. These changes call for an advance in certain size extras as applied to rounds, squares, round cornered and Gothic shape bars, and eliminate the $5 a ton extra for ordinary forging quality. The premiums on extra forging quality and also on extra special carburizing steel have been reduced from $10 a ton to $5. Silicon differentials also have been revised under the new schedule.

The effect of the changes in the forging extras may result, in contrast with the probable reaction of general users of commercial steel bars, in forgers holding off, where they can, until after Aug. 10 in the release of specifications. The effects of these changes are now being carefully studied by the trade.

The new size extras, as indicated, will apply to requirements of forgers and general consumers alike. The proposed changes, some trade interests believe, are designed primarily, or at least in part, to clarify a rather unsatisfactory situation prevailing with regard to the $5 forging extra, which is to be eliminated. Since this extra was first put into effect a considerable time ago, demands of general commercial bar users have become increasingly rigid, until their requirements so closely paralleled those of the average forger that difficulty in applying the extra developed, it is said.

General consumers of commercial steel bars in covering now may avoid the new size extras on shipments up to the first of next quarter. This should be particularly true with regard to those not under contract and where they are under contract it also appears probable, according to some trade opinion, that they will be permitted opportunity to cover before the new extras apply.

The proposed size extras will be 10 cents per hundred pounds on bars from 1 9/16 to 2 1/16 inches; 15 cents on 2⅛ to 2½; and 20 cents on 2 9/16 to 3 1/16. At present no extras apply on these sizes. On sizes ranging from 3⅛ to 3 9/16 inches the new extra will be 25 cents, as against 10 cents at present; and on 3⅝ to 4 1/16 inches, 25 cents, as against 15 cents. Revisions also will be made in certain size flats to bring them in line.

Action is being initiated by the Carnegie Steel Co., but indications are that all others will follow. Price lists will be brought out by individual companies rather than through the American Iron and Steel institute as was the case when the Steel code was in effect.

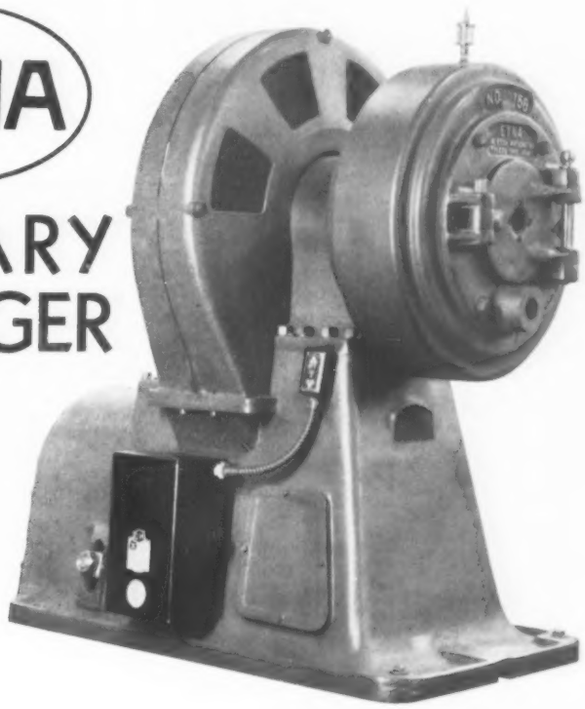
Conveying equipment manufacturers are taking increasing tonnages of bars to meet larger demand for equipment, particularly from coal companies.

**Pittsburgh**—Effective Aug. 10, revised extra lists on carbon steel bars and small shapes are being adopted by the trade following the announcement by Carnegie Steel Co. incorporating certain changes. Adjustments are primarily to bring them more nearly in line with manufacturing costs. Base price on merchant steel bars remains 1.80c, base, Pittsburgh.

**Cleveland** — Steel bar tonnage booked here in July was 10 to 15 per cent less than that in June, which in turn was the best month of the year next to May. A good run of miscellaneous orders supplements the relatively heavy demand from automobile, tractor and implement manufacturers. The former includes some specifications from small arms and machine gun manufacturers. Base prices are steady, while a new card of extras is being issued, effective


ETNA

ROTARY SWAGER



This Etna Rotary Swager No. 158 is of the Timken Roller Bearing type.

The spindle is hardened and ground, and dies are easily controlled to accommodate very small material.

Etna Swaging Machines are built in capacities from ⅜" to 4" or more diameter and in die lengths up to 18".

The appearance of Etna Swagers do credit to any plant, and their ready accessibility stands strongly in their favor.

**THE ETNA MACHINE COMPANY**

3400 Maplewood Ave.

TOLEDO, OHIO

Aug. 10, to bring them more nearly into line with present manufacturing costs, complete details of which will be found in the Philadelphia bar report.

**Chicago**—Steady bar demand continues from a diversified list of smaller consumers, while some business is being received for new automobile models in addition to tonnages for production of present series. No slackening is apparent in requirements of farm implement manufacturers, with tractor divisions holding at capacity. Bar purchases generally are small individually and consumers still are not disposed to cover far in the future. Prices are steady, however.

**Boston**—Commercial steel bar demand is steady with a spotty improvement in forging and alloy bar buying. Bolt manufacturers have increased specifications slightly. Small tool makers in several instances are fairly active. Prices are steady and unchanged.

**New York**—Owing to higher size extras, scheduled to go into effect Aug. 10, on certain descriptions of commercial bars, general consumers are expected to buy more freely before that time on material for delivery up to the first of next quarter. Consumers of forging steel, on the other hand, may hold up such specifications as they can until after Aug. 10 in view of the elimination of the $5 extra for forging quality and the reduction from $10, the present differential, to $5 in the premium on extra forging quality. The base price is unchanged at 1.80c, Pittsburgh, or 2.15c, New York.

**Youngstown**—Miscellaneous consumers continue to furnish most steel bar demand but automotive business is expanding and prospects for a heavy volume of business from this industry over the balance of the month are promising. Partsmakers are ordering actively. No pressure is being exerted on prices with buyers largely ordering prompt shipments. The market continues firm on the basis of 1.80c, Pittsburgh.


Manipulators
CHARGING MACHINES

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the Leaders!

Wellman originated the mechanically operated charging machine—and every step in our development of this giant steel hand has been a big stride forward in handling speed and economy. Wellman Chargers and Manipulators are the nearest thing to completely automatic machines.

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THE WELLMAN ENGINEERING CO.
ENGINEERS CONSTRUCTORS MANUFACTURERS
WELLMAN
CLEVELAND, OHIO
BIRMINGHAM • NEW YORK • MEXICO CITY


# Plates

**Plate Prices, Page 70**

**Pittsburgh**—Ohio River Co., Cincinnati, has placed a contract for two towboats and ten standard steel coal barges with a Pitsburgh barge shop. It is understood the order will involve over 3500 tons of plates, channels and angles and that the steel will be furnished by a Youngstown producer. American Pipe & Construction Co., Amsterdam, N. Y., promises to close soon on four dump scows for the New York state barge canal, requiring about 600 tons. The last word on the Mississippi Valley Barge Line's inquiry for 30 to 40 barges is that some action may be taken upon the return of one of the company's executives, which is expected this week. This inquiry may amount to as much as 9000 tons of plates and structural shapes. Plates are firm at 1.80c, base, Pittsburgh.

**Cleveland**—Some substantial orders for plates have been placed. For 100 automobile freight cars on which Chesapeake & Ohio issued an inquiry last week, approximately 1500 tons of plates, shapes and other steel items will be required. Tank business is fairly active, and there is more activity in oil refinery equipment generally. Prices are firm.

**Chicago**—Plate orders generally are confined to small individual lots except for some structural projects. Business from railroads and equipment builders is light, and a lull has developed in tank work. A fair volume of prospective tank orders is pending, but awards are slow.

**Boston**—Large tank requirements are heavier and plate buying has improved. Miscellaneous small orders hold and most sellers report July

sales heavier than the previous month. At least one New England railroad is buying more plates. Price are firm at 2.22c, Boston.

**New York**—Buying of plates is fair with interest centered on opening of bids this week on 13 naval craft requiring over 24,000 tons of steel. Texas Co., New York, is reclaiming some steel for its new development in Texas but is placing a fair amount of new tonnage. Steel for its high-pressure units is yet to be placed. Alco Products Inc., New York, has booked 100 tons of steel pipe for Fairport, O.

**Philadelphia**—A re-check on the ferryboat for the Virginia Ferry Corp. indicates it will require approximately 1000 tons of plates, shapes and bars, principally plates. Figures on this boat were submitted Aug. 2. The Pusey & Jones Shipbuilding Co., Wilmington, Del., built a similar sized ferryboat for this corporation sometime ago. This project and the five barges for the Pan-American Petroleum & Transportation Co., New York, requiring 1200 tons of plates, shapes and bars, are the only two private ship jobs reported as active at the moment. With labor trouble continuing, the New York Shipbuilding Co., Camden, still holds up specifications against navy work now on the ways and is making no effort to bid on the navy craft up for figures Aug. 7. There are 13 of these boats, all scheduled to be built in private yards, requiring more than 24,000 tons of steel. Indications are that no ship yard in this district will figure. Plate prices are unchanged at 1.90c, Coatesville, Pa., or 1.99½c, Philadelphia.

**San Francisco**—Demand for plates is limited to relatively small lots. Some interest is being taken in the naval drydock at Pearl Harbor, T. H., scheduled to come up for figures within the next 30 days and involving close to 20,000 tons of plates in addition to over 10,000 tons of shapes.

**Seattle**—Tacoma will call for bids within 30 days for a major water system extension involving about 1800 tons, following P.W.A. approval of a loan and grant of $338,400 toward the total cost of $467,000. In the Seminole dam project, Wyoming, 200 tons metal pipe and fittings and 170 tons of penstock and outlets are involved, Winston Bros., Minneapolis, low.

## Contracts Placed

3600 tons, 20 miles, 24-inch steel pipe line, Phillips-Petroleum Co., Bartlesville, Okla.; 3050 tons to Naylor Pipe Co., Chicago, and 550 tons to Wyatt Metal & Boiler Works, Dallas, Tex.

400 tons, tanks, New England Alcohol Co.; Everett, Mass., to Chicago Bridge & Iron Works, Chicago.

250 tons, 80,000-barrel tank, Hartford Electric Light Co., Hartford, Conn., to Chicago Bridge & Iron Works, Chicago.

160 tons, tanks, 30,000-barrel capacity, Webber Motor Co., Sinclair Oil Co. distributor, Bangor, Me., to Chicago Bridge & Iron Works, Chicago.

Unstated tonnage for 100,000-gallon tank for state hospital at Exeter, R. I., to Pittsburgh-Des Moines Steel Co., Pittsburgh.

## Contracts Pending

1800 tons, Tacoma water system extension; bids soon.

1500 tons, tanks, 350,000-barrel capacity, Pan-American Petroleum Co., Chelsea, Mass.

600 tons, four dump scows, for New York state barge canal, delivery to American Pipe & Construction Co., Amsterdam, N. Y. (Noted briefly in STEEL, July 29.)

600 tons, tanks, 131,000-barrel capacity, Metropolitan Coal Co., Chelsea, Mass.

370 tons, penstocks and miscellaneous, Seminole project, Wyoming; Winston Bros., Minneapolis, low.

200 tons, parcel post building, Boston. Boilers awarded Union Iron Works, Erie, Pa.

145 tons, survey boat for United States engineers, Portland, Oreg.; bids opened.

100 tons or more, fuel storage tanks, Woodman's Garage Co., Cities Service Co., distributor, Bangor, Me.

Unstated, Fort Peck project, Montana; bids by United States engineer, Kansas City, Aug. 5.

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# Sheets

Sheet Prices, Page 70

**Pittsburgh**—Still maintaining an active tone, the sheet market has featured slightly less diversification in orders the past week, and a smaller number of the miscellaneous orders. More automotive business has begun to appear, and base prices are reported firm on this type of business, but the application of drawing extras to the automotive trade has been irregular. Ford Motor Co. is understood to have allocated among a number of producers of sheet and strip, material for producing about 170,000 to 175,000 cars, which would involve the purchase of about 60,000 tons of flat-rolled steel. Common black and galvanized sheet mills are operating at 55-60 per cent, as are full finished mills, the latter being a sharp improvement from the week preceding. Wheeling Steel Corp. last week announced that its Whitaker works will place four more hot mills in operation Aug. 7, the first time since June, 1933, this plant has been on full.

**Cleveland** — Deep-drawing extras on automobile sheets are being waived by some important producers. These extras on cold rolled sheets have been $3 a ton for No. 12 gage and heavier; $5 a ton on No. 13 to No. 21 gage; and $7 a ton on No. 22 gage and lighter. The same extras also applied on hot-rolled pickled sheets, and also on enameling sheets. The extras on enameling sheets have not been waived, but consumers are pressing mills for similar concessions.

Automobile manufacturers are making their final purchases for current models, and while some specifications have been issued for the new series, in many instances releases have not yet been issued.

After a brief lull in stove and washing machine requirements, orders from these sources increased during the week. Refrigerator production is at midseason low, but the outlook in this industry also is said to be good.

**Chicago**—Sheet demand is holding well, aided by a steady rate of buying by the automotive industry. Some tonnage is being received for new models and such business is expected to increase during the next several weeks. Miscellaneous consumers are well represented in new business, though orders still are principally for early needs and forward buying is restricted. Prices have been well maintained on recent business that has been placed.

**Boston**—Carlot sheet orders are more numerous. Small tank fabricators are more active on basement oil burner tanks, namely of 275-gallon capacity, and are buying blue annealed, No. 12 and 14 gage, in larger quantities. Other fabricators indirectly connected with the oil industry are heavier buyers. Sheet-metal work for the parcel post building, Boston, will require 100 tons of sheets, mainly galvanized.

Inquiry for close to 9000 No. 18 gage hot-rolled and annealed sheets has been issued by a Springfield, Mass., oil burner and pump subsidiary of a large oil company.

**New York**—Oil company demand continues to feature the market. Inaddition to the 725 tons of light sheets placed here recently by one company, the Standard Oil Co. of New Jersey is placing substantial tonnage for oil burners, and through one of its subsidiaries still is in the market for a round tonnage of No. 18 gage hot-rolled annealed sheets. Miscellaneous buying appears irregular, some sellers reporting little business and others recording more activity. July tonnage is down somewhat from June, but better than generally expected. Prices are unchanged.

**Philadelphia**—Sheet business the

## Behind the Scenes with STEEL

### Advance Info

NEXT week, according to reliable information from the editorial department, will begin in STEEL a new feature to be headed "*Forum on Modernization.*" For the past ten weeks leaders in the machine tool industry have explained why it is economically unsound for you manufacturers to postpone replacing obsolete machines, and we hope you have taken their words to heart and gone out and bought yourself some shiny new machines.

Now, in STEEL'S new *Forum*, leading executives in many other branches of the equipment building industry will have the opportunity to give their ideas on why modernization pays. Several will be heard from each week. Will you listen?

* * *

### Public Heroes

SPEAKING of editors (shh!) brings to mind the fact that two on the STEEL staff have recently crashed the pages of various public prints with resplendent photographs showing faces free from ink stains. They even wore clean collars and, of all things, neckties!

E. F. Ross, associate engineering editor, occupied a prominent spot on page 46 of the July *Metal Progress*. He has been chairman of the Cleveland A.S.M. chapter for the past year.

Managing Editor E. C. Barringer headlined a half-page advertisement for Hudson-Terraplane which appeared in leading daily newspapers throughout

the country. His remarks on the trend to all-steel bodies for automobiles were considered a good plug for the Hudson people. Exploding some malicious rumors which have been circulating around, we can report that Mr. B. did not receive a new Hudson car for his testimony (although he has a two-car garage), but he did receive a huffy letter from the National Hardwood Lumber association, taking him to task for slighting combination wood and steel auto bodies. Such is the price of fame!

* * *

### Weary Willie

*ANTICS and pedantics of the New Deal are always good for a laugh. One of the latest concerns an Ohio boy who was sent home from a CCC camp to his mother accompanied by a report from a government doctor stating he was sent home to "recuperate from an attack of acute nostalgia."*

*The lad's mother read the report, snorted angrily a few times and marched down to see her congressman to file a claim for damages against the government. Said her son "never had trouble with nostalgia until he left home."*

* * *

### 300 Say "Yes"

CIRCULATION department tells us it is glad to report net paid circulation for STEEL in the six months ended June 30 increased exactly 301 copies. With five readers to the copy (average) this means 1500 more in our ever-growing ranks. Renewal percentage for the period figures out at 76.68, which means that by the time you count in deaths, bankruptcies, consolidations, mergers and the like, nearly everyone who reads STEEL wants to keep it coming.

To all readers and prospective readers: Thank you for this support. Rest assured that STEEL will never let up in its efforts to present the latest, most worthwhile, most interesting and most instructive information in the production, processing, distribution and use of metals and allied products.

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* * *

*Sincere thanks to all who submitted entries in our signature-interpreting contest which closed last Thursday. Judges are now sorting out the replies to determine the $5 prizewinner. Watch this column next week for the lucky one. We only wish every one could be a winner.*

—SHRDLU

past few days has been decidedly spotty, with tonnage in July somewhat under the preceding period, according to most leading sellers. However, the July tonnage held up better than originally anticipated, and the outlook for this month is for improvement. Stovemakers, radio manufacturers and autobody manufacturers, in particular, should show increasing interest. Incidentally, a local autobody manufacturer is expected to eventually benefit by the recent court action permitting Willys-Overland to produce 10,000 additional cars, although this should not be reflected here much before the end of this year, when work is scheduled to get under way. Producers' prices are unchanged.

**Youngstown, O.**—Buying in general is extremely active for July. Miscellaneous consumers are ordering larger tonnage and some automotive business has developed. Mills are booking business only for the current quarter. Prices are firm.

**Cincinnati**—Demand for sheets continue active, with tonnage at the best levels of July. Galvanized is strong, remaining a feature of the market. Automotive needs are surprisingly steady, keeping rolling schedules above 50 per cent.

**St. Louis**—Producers and distributors of steel sheets report fairly steady specifications, particularly for lighter materials. Total July shipments compare favorably with those of the preceding month, and were substantially larger than a year ago.

**Birmingham, Ala.**—Sheet mill operations are steady, a fair volume of new business developing.

## Pipe

**Pipe Prices, Page 71**

**Pittsburgh**—Several small line pipe projects are before the trade, but absence of larger jobs still is noted. Peoples Natural Gas Co. expects to replace one 4-inch and one 8-inch gas pipeline with one 6-inch pipeline across the Kiskiminetas river between Westmoreland and Indiana counties. Standard Oil Co. of Ohio expects to construct several small 3-inch pipe lines on the right bank of the Ohio river at Sciotoville near Portsmouth, O. All discounts on tubular products are without change.

**Chicago**—Cast pipe continues slow, despite expectations of producers of improved business in the near future, when arrangements for financing of proposed work by various municipalities is expected to be further advanced. A few small projects are pending, including sewage disposal and filter plants for several nearby points. Prices are steady on what business is being placed.

**Boston**—Cast pipe buying is limited to several hundred tons, going mostly to the New England foundry. Merchant steel pipe is moving in fair and steady volume, CCC camp requirements being a factor. Several hundred tons for the Clinton, Mass., dam projects have been placed, mostly 20-inch light shell steel pipe. Wrought pipe continues dull.

**New York**—Cast pipe inquiry and buying are light, an exception being close to 2000 tons, 24-inch, for East Orange, N. J., on which bids are in. Buying is mostly for small fill-in lots and this type of business is slower than a week ago.

**Youngstown, O.**—Some business is coming in from the oil country; however, lots are small. This is especially true with regard to line pipe. Wrought pipe appears a little more active.

**San Francisco**—Los Angeles may purchase close to 2100 tons of 60-inch cast iron pipe for the White Point outfall sewer instead of trying reinforced concrete pipe. Awards


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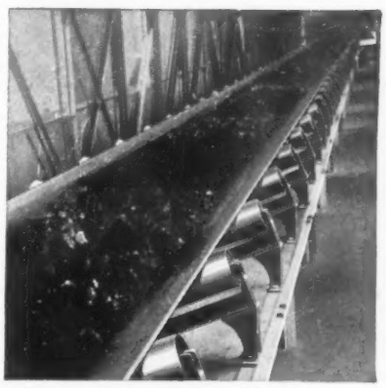

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for the week were confined to lots of less than 100 tons. The national park service, San Francisco, will open bids Aug. 8 for 200 tons of 10 and 12-inch steel pipe.

**Birmingham, Ala.**—Expectations are that the sluggishness in the market which has been apparent for several weeks will clear up shortly. Production is estimated at about 40 per cent. Warehouses are well supplied with standard sizes.

**Seattle**—Agencies are marking time until federal funds are available for many projects which municipalities are planning. Immediate business is lacking but the prospects are greatly improved. Aberdeen, Wash., plans reconstruction of 6 miles of pipe, estimated at $126,000, for which a $36,000 federal grant will be asked.

## Cast Pipe Placed

600 tons, 24-inch, Springfield, Mass., to R. D. Wood & Co., Florence, N. J.
500 tons, mostly 12-inch, Newton, Mass., to Warren Foundry & Pipe Corp., Everett, Mass.

## Steel Pipe Placed

500 tons, 20-inch, and miscellaneous material, dam project, Clinton, Mass., to Walsh's Holyoke Steam Boiler Works, Holyoke, Mass.; plain end pipe to Taylor Forge & Pipe Works, Chicago; Arthur A. Johnson Corp., New York, general contractor.

## Cast Pipe Pending

2000 tons, 24-inch, class 150, East Orange, N. J.; bids in.
125 tons, sewage disposal plant, Chicago Heights, Ill.
Unstated tonnage, filter plant, Des Plaines, Ill.

## Wrought Pipe Pending

Unstated tonnage, 2425 feet, 12-inch black, Tygart river reservoir dam; Pittsburgh Piping & Equipment Co., Pittsburgh, low on July 20 bids received.

# Transportation

**Track Material Prices, Page 71**

Miscellaneous steel requirements of railroads for car repairs and maintenance of way aggregate a fair volume and rail mills have some backlog of rails yet to roll. Track accessory demand holds well and is heavier than in first half.

Chesapeake & Ohio opens bids Aug. 19 on 100 automobile cars with Evans Products Co. self-unloaders. Pullman Standard Car Mfg. Co., Chicago, probably will build Norfolk Southern's 500 all-steel box cars at its plant at Richmond, Va. It has started work on 1500 freight cars for the Chesapeake & Ohio at its shops at Butler, Pa.

Domestic freight car awards in July included only 500 box cars for the Norfolk Southern, although in that month the award of 500 subway cars for the New York board of transportation also attracted considerable attention. Freight car awards for the first seven months totaled 6833, against 23,278 in the corresponding period in 1934. Further comparisons follow.

| | 1935 | 1934 | 1933 | 1932 |
|---|---|---|---|---|
| Jan. | 24 | 152 | 3 | 159 |
| Feb. | 806 | 19,725 | 0 | 35 |
| March | 0 | 30 | 5 | 105 |
| April | 350 | 800 | 50 | 0 |
| May | 2 | 717 | 8 | 60 |
| June | 5,151 | 1,835 | 500 | 0 |
| July | 500 | 19 | 306 | 25 |
| 7 Mo. | 6,833 | 23,278 | 872 | 444 |
| Aug. | | 105 | 202 | 6 |
| Sept. | | 7 | 23 | 1,298 |
| Oct. | | 75 | 514 | 0 |
| Nov. | | 254 | 533 | 2 |
| Dec. | | 110 | 316 | 50 |
| Total | | 23,829 | 2,460 | 1,739 |

## Car Orders Pending

Atchison, Topeka & Santa Fe, one light-weight chair car, bids asked.
Chesapeake & Ohio, 100 automobile cars; bids Aug. 19.

## Locomotives Pending

United Fruit Co., Boston, one 2-8-2 type locomotive for Cuba, bids asked.

## Buses Booked

American Car & Foundry Co., New York: 12 city coaches for Worcester street railway, Worcester, Mass.
Kenworth Motor Truck Corp., Seattle: Three intercity for North Coast Transportation Co., Seattle; four intercity for Washington Motor Coach Co., Seattle; two 21-passenger for Central Canadian Greyhound, Calgary, Alta.

## Ferroalloys

**Ferroalloy Prices, Page 72**

**New York**—Movement of ferromanganese continues unusually good for this season of the year. Indications point to July shipments as having been better than June and, judging from the present trend in steelmaking operations, it would not prove surprising if August specifications would be even better. Prices are unchanged at $85, duty paid, Atlantic and Gulf ports. Spiegeleisen also has been moving better this summer than the trade originally expected, with domestic material, 19 to 21 per cent, unchanged at $26, Palmerton, Pa., on lots up to 50 tons, and $24 on 50 tons and over.

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# Shapes

**Structural Shape Prices, Page 70**

**New York** — Structural shape awards and new inquiries are light, with the bulk of pending tonnage representing bridges and public work. Plans have been completed for additional sections of the west-side elevated highway and bids are expected in several weeks.

**Pittsburgh** — A 1500-ton state bridge for Fifth street, Parkersburg, W. Va., is outstanding among new inquiry in this district. Other inquiry includes a 700-ton addition to the galvanizing department for Newport Rolling Mill Co., Newport, Ky., and 2000 tons in relocation of Baltimore & Ohio railroad bridges at Grafton and Phillipi, W. Va. The state secretary of highways has announced allocation of $11,483,613 among more than 23 railroads operating in Pennsylvania, this fund having been set aside by the federal government for the elimination of railroad grade crossings in the state. Dravo Contracting Co., Pittsburgh, is low at $1,692,224 for the roller gate Winfield dam on the Kanawha river.

**Cleveland**—Higher prices on structural shape fabricated work are noted. Since fabricators decided to file all bids with the American Institute of Steel Construction, New York, prices in this district are up $3 to $5 a ton on ordinary work, and $5 to $10 a ton on special classes. Fabricators now are figuring overhead in their bids, whereas this has been waived in many instances over the past year or more. Contractors with whom bids had been filed prior to the new arrangement have opportunity to close at those figures, and in some cases have placed tonnages tentatively. Where work is slow to be closed, bids may be withdrawn. Some substantial tonnages are expected to be placed shortly. The current market is restricted mainly to small lots. Mill prices on shapes are firm.

**Chicago**—Piling orders overshadow awards of fabricated steel. About 7600 tons of piling has been booked recently for various public projects, including the Monroe, La., seawall and the Clinton, Iowa, lock. An eastern fabricator again has been named as low bidder on structural material for a Mississippi river lock, this being the new Boston, Ill., unit involving 950 tons of shapes and 1400 tons of piling. Bids on the Dubuque, Iowa, dam close Aug. 27 with 4200 tons of shapes and piling involved. Five Missouri bridges will take 1075 tons.

**Boston**—Except for 450 tons for a state bridge at Montague, Mass., structural awards are light, with several hundred tons pending for bridges in the New England district. Two Boston schools taking 350 tons will be readvertised, first bids being over appropriations. PWA building programs are developing slowly throughout the district.

**Philadelphia**—A few fair size projects are active in this district, and in Washington there are two large government jobs, one the department of interior building, involving an estimated total of 10,000 tons of shapes, in addition to a heavy quantity of other steels, and on which the George A. Fuller Co., that city, general contractor, is low, and the other a 2000-ton addition to the Archives building on which general contractors bids have just gone in. Actual awards over the past week have been exceedingly light. Shapes are unchanged at 1.90c, Bethlehem, Pa., or 2.01½c, Philadelphia.

**Birmingham, Ala.** — Structural steel fabricating shops are adding steadily to their backlogs and are confident the remainder of the year will see better business than has been experienced so far in 1935. Ingalls Iron Works Co., Birmingham, has contract from war department for three 300-cubic yard steel dump scows which will be built at the Chickasaw works, near Mobile, Ala., with steel fabricated here, 600 tons. Nashville Bridge Co., Nashville, Tenn., will fabricate 200 tons for superstructure of bridge at Yazoo City, Miss.

**Seattle**—Structural shapes continue to lead other steel items in demand. Pacific Coast Steel Co is apparently low at $398,298, delivery to Bonneville, Oreg., dam, for lock equipment and machinery, totaling 1790 tons. For the Seminole dam, Wyoming, Winston Bros., Minneapolis, are low, the project requiring 1272 tons.

**San Francisco**—Largest structural award in the week involved 600 tons for a studio for Warner Bros., Burbank, Calif., placed with Virginia

## Shape Awards Compared

| | Tons |
|---|---|
| Week ended Aug. 3 | 14,400 |
| Week ended July 27 | 5,173 |
| Week ended July 20 | 16,598 |
| This week, 1934 | 16,134 |
| Weekly average, 1934 | 16,284 |
| Weekly average, 1935 | 14,457 |
| Weekly average, July | 15,240 |
| Total to date, 1934 | 554,287 |
| Total to date, 1935 | 462,627 |

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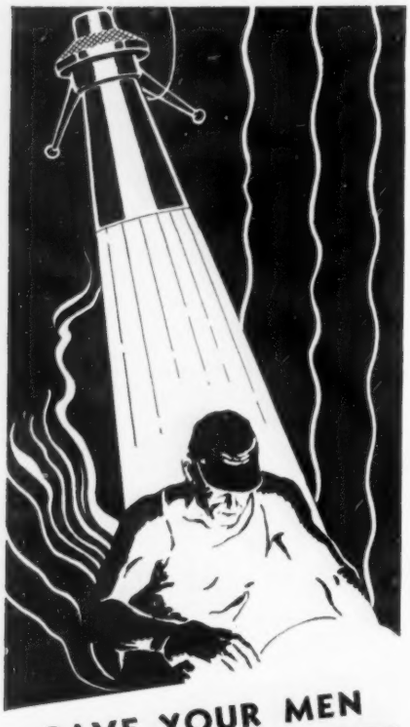

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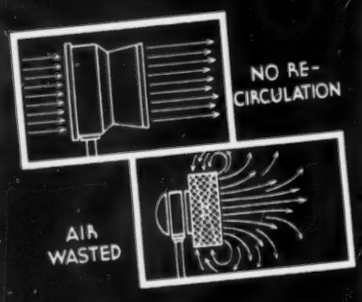


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Bridge & Iron Co., Roanoke, Va. United States Fireproofing Co., Chicago, was low bidder on alteration of the mint at Denver, Colo., calling for 700 tons. To date this year 53,600 tons have been booked, compared with 83,733 tons for the same period a year ago.

## Shape Contracts Placed

5300 tons, piling, levee wall, Monroe and West Monroe, La., to Jones & Laughlin Steel Corp., Pittsburgh.

1500 tons, piling, lock No. 13, Clinton, Iowa, to Inland Steel Co., Chicago; McCarthy Improvement Co., Davenport, Iowa, general contractor.

935 tons, Clinton, Iowa, lock, to Milwaukee Bridge Co., Milwaukee.

800 tons, piling, southwest side intercepting sewer contract No. 1, Chicago, to Inland Steel Co., Chicago; Herlihy Mid-Continent Co., Chicago, general contractor.

605 tons, Crafts building, Burbank, Calif., to Virginia Bridge & Iron Co., Birmingham, Ala.

600 tons, studio, Warner Bros., Burbank, Calif., to Virginia Bridge & Iron Co., Roanoke, Va.

600 tons, by war department to Ingalls Iron Works Co., Birmingham, for three dump scows.

450 tons, state bridge, Montague, Mass., to Boston Bridge Works Inc., Combridge, Mass.; Carlo Bianchi & Co. Inc., Framingham, Mass., general contractor, at $104,021.25.

370 tons, powerhouse, American Molasses Co., Brooklyn, N. Y., to Lehigh Structural Steel Co., Allentown, Pa.

360 tons, Pennsylvania railroad bridge, Ft. Wayne, Ind., to McClintic-Marshall Corp., Bethlehem, Pa.

300 tons, school, Harverstraw, N. Y., to Selbach-Meyer Co., West New York, N. J., with Lehigh Structural Steel Co., Allentown, Pa., to fabricate. H. T. Bogart Co., general contractor.

260 tons, route marker supports, for state of New York, to American Bridge Co., Pittsburgh.

260 tons, state highway bridge, Wickenburg, Ariz., to McClintic-Marshall Corp., Bethlehem, Pa.

260 tons, Salmon river bridge, Riggins, Idaho, to unnamed interest.

205 tons, transit shed, Berth 48, Long Beach, Calif., to Atlas Scraper & Engineering Co., Bell, Calif.

200 tons, to Nashville Bridge Co., Nashville, Tenn., for superstructure Yazoo City, Miss., bridge; sublet by Leavenworth, Kans., contractor.

175 tons, plant addition, Bundy Tubing Co., Detroit, to R. C. Mahon Co., Detroit.

175 tons, building, Chevrolet Motor Co., Tarrytown, N. Y., to Norton Steel Co., New York.

160 tons, alterations, elevator system, municipal building, New York, to Norton Steel Co., New York.

155 tons building, Beaumont, Tex., to Belmont Iron Works, Philadelphia; through M. W. Kellogg Co.

145 tons, bridge, East Rockaway N. Y., to American Bridge Co. Pittsburgh; through Andrew Weston Inc.

140 tons, including 50 tons of joists, two buildings for University of Arizona, Tucson, to unnamed interest.

125 tons, grade crossing, Mumford, N. Y., Baltimore & Ohio railroad, to Genesee Bridge Co. Inc., Rochester, N. Y.

120 tons, guides, Boulder dam, Colo., spec. 680D, United States bureau of reclamation, to Babcock & Wilcox Co., New York.

100 tons, novitiate building, New Britain, Conn., to Standard Structural Steel Co., Hartford, Conn., Southern New England Construction Co., general contractor.

100 tons, bridge, Brooklyn-Manhattan Transit Co., Seventh avenue and Thirty-seventh street, Brooklyn, N. Y., to Norton Steel Co., New York.

## Shape Contracts Pending

10,000 tons, shapes, department of interior building, Washington, George A. Fuller Co., that city, low on general contract; at least 3500 tons of reinforcing bars also required, in addition to more than 6200 tons of steel pipe and 1200 tons of steel sheets for piling, should one alternate be decided upon.

4200 tons, including 3000 tons of piling, dam No. 11, Dubuque, Iowa; bids Aug. 27 to United States engineers, Rock Island, Ill., Aug. 27.

2350 tons, including 1400 tons of piling; also 95 tons of forgings and 68 tons of castings, lock No. 17, New Boston, Ill.; Massman Construction Co., Kansas City, Mo., low for general contract, Independent Bridge Co., Pittsburgh, low for fabricated steel.

2000 tons, addition, Archives building, Washington; bids opening Aug. 3.

2000 tons, structural shapes and steel sheet piling, roller gate Winfield dam, Kanawha river; Dravo Contracting Co., Pittsburgh, low at $1,692,224 on July 26 bids. Second low, Hardaway Construction Co., Columbus, Ga., at $1,773,747, followed by Merritt, Chapman & Scott, New York, $1,902,184.

2000 tons, relocation of bridges, for Baltimore & Ohio railroad, Grafton and Phillipi, W. Va.; bids Aug. 19 to the federal engineers at Pittsburgh.

1790 tons, lock operating equipment and machinery, Bonneville, Oreg., dam; Pacific Coast Steel Corp., Seattle, apparently low.

1272 tons, Seminole dam project, Wyoming; Winston Bros., Minneapolis, low.

1075 tons, five Missouri state highway bridges.

750 tons, power plant, Sheffield, Ala.

700 tons, mint addition, Denver, Colo.; United States Fireproofing Co., Chicago, low at $289,500.

500 tons, 6-span Knik river bridge, Alaska, for Alaska road commission; Duffin Iron Co., Chicago, apparently low.

500 tons, roller gates, Imperial dam desilting works, All-American canal system, Los Angeles; Dravo Contracting Co., Pittsburgh, low bidder on general contract.

450 tons, West Side housing development, Cleveland.

400 tons, high school, Reading, Pa., bids postponed from July 30 to Aug. 26.

350 tons, state bridge Toutle river, Washington; Sheble Construction Co., Seattle, low.

350 tons, bridge, Columbus Falls, Mont.; bids opened.

350 tons, Washington Irving and Robert G. Shaw schools, Boston, to be readvertised, first bids over appropriation.

342 tons, Flathead river bridge, Montana; bids opened.

325 tons, foundry addition, Budd Wheel Co., Detroit.

325 tons, bridge, Central railroad of New Jersey, Raritan, N. J.; bids Aug. 9 direct.

180 tons, building for Ohio Oil Co., Findlay, O.; also 50 tons of reinforcing bars.

170 tons, school, Poland, N. Y., North Park Realty Co., Buffalo, N. Y., gen-

eral contractor.

155 tons, state bridges, Maine; bids in.

150 tons, postoffice, Alhambra, Calif.; bids Aug. 5.

150 tons, bridge, Peth, N. Y., for Baltimore & Ohio railroad.

134 tons, steel sheet piling for Tygart, W. Va., dam, Jones & Laughlin Steel Corp., Pittsburgh low on July 30 bids; bid of 2.20c submitted on 258,024 pounds and 3.70c on 11,264 pounds.

115 tons, plant building, Ft. Wayne, Ind., for International Harvester Co., Chicago; bids Aug. 5.

100 tons, postoffice, Lodi, Calif.; bids postponed until Aug. 20.

100 tons, addition, Electric Storage Battery Co., Philadelphia.

100 tons, library, Rhode Island state college, Kingstown, R. I.

100 tons, building, Middlebury college, Middlebury, Vt.

Unstated, trestles and miscellaneous items, Fort Peck, Mont., dam, bids to United States engineer, Kansas City, Mo., Aug. 5.

Unstated, bureau of roads bridge, Bitterroot river, Montana; bids at Missoula, Mont., Aug. 6.

Unstated tonnage, addition to the Obear-Netser Glass Co. plant, East St. Louis, Ill.; Amsler-Morton Construction Co., Fulton building, Pittsburgh, general contractor.

# Reinforcing

**Reinforcing Bar Prices, Page 71**

**New York**—Buying is light. Opening of bids on several of the largest projects in this district again have been postponed. Prices on open bids are firm, and generally holding well on the current small volume.

**Pittsburgh**—In certain western districts bending charges on reinforcing steel bars have been made at $4 and $12 against unchanged extras of $6 and $16 which are being observed in all leading eastern district markets. A charge of $1 a ton has also been made in engineering charges on larger-size jobs. York Engineering & Construction Co., York, Pa., which is low at $1,822,184 for construction of lock and dam No. 9 in the Allegheny river, has commenced installing equipment. Dravo Contracting Co., Pittsburgh, will require about 450 tons of reinforcing bars for construction of the roller gate type Winfield dam on the Kanawha river. The market is 2.05c, base, Pittsburgh, for carload lots of new billet steel bars.

**Cleveland**—While mill prices on reinforcing bars are steady, fabricators are competing sharply by sacrificing on engineering and shop work. This situation may right itself as bid prices are becoming unprofitable. For three buildings at Cleveland's easterly sewage disposal plant 865 tons of reinforcing bars and 665 tons of structural shapes are pending.

**Chicago**—Orders for large lots of reinforcing bars are few, one exception being 650 tons for the Clinton, Iowa, river lock. Additional orders for Mississippi river lock and dam construction are in prospect, while better business for highway building also is looked for. Illinois is expected to start work on a large highway program about the middle of this month, while several other nearby states shortly will be more active on construction sponsored by the federal work-relief fund. Private building continues to furnish a fairly large number of small orders for bars. Mill prices are steady, though some concessions still are noted on fabricated work.

**Boston**—Reinforcing bar buying is light. A 100-ton bridge award is outstanding. Inquiry is sluggish and the outlook is dimmed by indications Massachusetts will build macadam instead of reinforced concrete highways under its PWA program. Reinforcing bar prices are somewhat irregular.

**Philadelphia**—While about 350 tons of reinforcing bars will be required for three public projects on which bids will be opened in this district shortly, and some substantial tonnage is active in Washington, including at least 3500 tons for the department of interior building, the general situation in reinforcing bars is very spotty. No orders of size have been placed here in considerable time and state road work and grade crossing elimination construction is still negligible. So conflicting are various reported policies in Washington that it is difficult for sellers to draw any definite conclusions as to the outlook in grade crossing and road work. Some trade leaders now believe the grade crossing elimination program is going to fall far short of expectations, particularly where the railroads would be called upon to supply a portion of the money. Billet steel bars, cut lengths, in this district are still holding at 2.05c, Pittsburgh, or 2.36c, Philadelphia. Reports are that a reduction in the bending extra and in the charge for engineering service are impending.

**Seattle**—Demand is improving as federal funds are being distributed but individual orders continue in

## Concrete Awards Compared

| | Tons |
|---|---|
| Week ended Aug. 3 | 2,502 |
| Week ended July 27 | 1,410 |
| Week ended July 20 | 4,608 |
| This week in 1934 | 1,639 |
| Weekly average, 1934 | 4,084 |
| Weekly average, 1935 | 4,275 |
| Weekly average, July | 2,225 |
| Total to date, 1934 | 143,675 |
| Total to date, 1935 | 136,818 |


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small lots. The largest project pending involves 1275 tons for the Seminole dam, Wyoming, Winston Bros., Minneapolis, being low bidder.

**San Francisco**—The metropolitan water district, Los Angeles, has postponed opening of bids for placing 5125 tons for the Cajalco dam and dike, from Aug. 5 to Aug. 12. Bids also have been taken on 3996 tons for pipe lines in Sierra Madre and Pasadena, Calif. L. E. Dixon Co., Bent Bros. Inc., and Johnston ,of Los Angeles, are low bidders on the general contract, for the district, for placing 2425 tons for the Monrovia and San Rafael tunnels.

## Reinforcing Steel Awards

850 tons, Peck street sewers, Queens, N. Y., to Igoe Bros., Newark, N. J.; L. Tomasetti Contracting Co., New York, general contractor.

650 tons, lock No. 13, Clinton, Iowa, to Inland Steel Co., Chicago; McCarthy Improvement Co., Davenport, Iowa, general contractor.

250 tons, Dyckman street bridge on Henry Hudson parkway, New York, to Joseph T. Ryerson & Son Inc., New York; through Charles Schaeffer.

200 tons, delivery to FERA, New York; divided among several distributors.

142 tons, Pickens channel and Hall Beckley debris basins for Los Angeles county, California, to unnamed interests.

110 tons, state project, Grays Harbor county, Washington, to Northwest Steel Rolling Mills, Seattle.

100 tons, warehouse 2905 Nichols street, San Diego, Calif., to unnamed interest.

100 tons, state highway work in four counties, California, to unnamed interests.

100 tons, state bridge, Montague, Mass., to Northern Steel Co., Boston, Carlos, Bianchi & Co. Inc., Framingham, Mass., general contractor.

## Reinforcing Steel Pending

5125 tons, Cajalco dam and dike, metropolitan water district, Los Angeles, placing only; bids postponed from Aug. 5 to Aug. 12.

3996 tons, pipe lines in Sierra Madre and Pasadena for metropolitan water district, Los Angeles; bids opened.

3500 tons, department of interior building, Washington, George A. Fuller Co., that city, low on general contract; additional reinforcing bar tonnage may be required, depending upon type of foundation work to be eventually decided upon. ,

2425 tons, placing, Monrovia and San Rafael tunnels, metropolitan water district, Los Angeles; L. E. Dixon Co., Bent Bros. Inc. & Johnson, Los Angeles, low on general contract.

1275 tons, Seminole project, Wyoming; Winston Bros., Minneapolis, low.

1131 tons, including 791 tons of rail steel bars, mint, San Francisco; Clinton Construction Co., low on general contract at $813,000.

801 tons, conduit in Hall's canyon channel debris basin for Los Angeles county, California; bids opened.

725 tons, for delivery to Panama; bids Aug. 19.

640 tons, lock No. 17, New Boston, Ill.; Massman Construction Co., Kansas City, Mo., low for general contract.

550 tons, dam No. 11, Dubuque, Iowa; bids to United States engineers, Rock Island, Ill., Aug. 27.

506 tons, conduit in Verdugo wash, from Kenilworth avenue, to Los Angeles river for Los Angeles county, Calif.; bids opened.

450 tons, new billet steel bars, roller gate Winfield dam, Kanawha river; Dravo Contracting Co., Pittsburgh, low on general contract at $1,692,224 on July 26 bids.

200 tons, state highway projects, Washington; bids in.

170 tons, Uncompahgre canal project, Colorado; bids at Montrose, Colo., Aug. 8.

115 tons, state bridge, Atlantic county, New Jersey, bids Aug. 5; as noted in a previous issue, this project will also require 200 tons of shapes.

100 tons, two bureau of roads projects Oregon and Washington; bids at Portland, Oreg., Aug. 7.

100 tons, approximately, high school, Reading, Pa., bids postponed from July 30 to Aug. 26.

# Wire

Wire Prices, Page 71

**Pittsburgh** — The market on wire products remains firm and increased purchases have tested prices. Many distributors of rural wire products are making their obligations largely in anticipation of better fall demand. Advance buying by the automotive trade on spring wire, rods, and plain manufacturing wire is appearing.

**Cleveland**—A steady flow of orders for wire sustains mill volume. Business is well distributed among manufacturers and jobbers. Shipments of wire and fencing to agricultural areas show a slight reduction, much less than customary at this season.

**Chicago**—Only a small decrease occurred in wire business during July, the volume being better than expected for that month. The steadiness with which consumption of manufacturers' wire is maintained among miscellaneous consumers causes producers to expect continued demand during August, with the automotive industry expected to be a heavier buyer for new models. Merchant products remain fairly active, with sales continuing good in some farm districts.

**Boston** — Improvement in wire buying, while confined largely to specialties and manufacturers' wire, covers a broader range, and shipments are slightly heavier. Lighter products continue to lead. Steady demand at mills has lowered ingot stocks more rapidly than expected and raw steel production is going upward this week. Wire rod buying is heavier.

# Strip Steel

Strip Prices, Page 71

**Cleveland**—Strip steel specifications are fairly steady, some users releasing tonnages regularly. New orders during the week called for slightly smaller tonnage. Automobile manufacturers and partsmakers are expected to buy heavily this month.

**Pittsburgh**—Purchase of strip and sheets by General Motors' subsidiaries within the past ten days has been prominent. In addition, mis-


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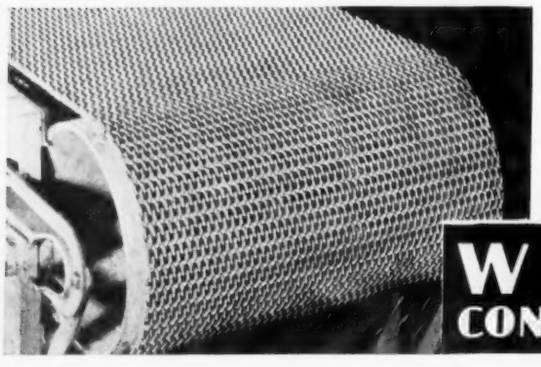

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cellaneous orders continue in good quantity. This type of buying, however, is not comparable to automotive demand. Base prices on strip steel are firm at 1.85c, Pittsburgh, for hot-rolled, and 2.60c, Pittsburgh or Cleveland, for cold-rolled.

**Chicago** — Strip demand holds closely to the rate of the past several weeks. Automotive orders, while smaller than 60 to 90 days ago, are fairly heavy for this period and are expected to improve shortly under stimulus of new model production. Most consumers still hold stocks low and orders are principally for prompt needs.

**Boston** — Decided improvement in hot strip buying indicates better sentiment among cold-strip rerollers, orders placed with the latter being due in part to sustained miscellaneous demand and increase in purchasing by automobile accessory producers. Slit sheets continue to cut into sales of cold strip. Reports of shading on cold strip prices are not confirmed.

**Philadelphia** — Strip specifications are spotty, with general volume possibly a shade better than earlier in the month. Some improvement is reported in specifications from radio manufacturers. Prices are unchanged at 1.85c, Pittsburgh, or 2.16c, Philadelphia for hot strip, and 2.60c, Pittsburgh, or 2.71c, Philadelphia, for cold strip.

**Youngstown, O.**—Strip buyers are entering the market on a larger scale. Considerable current demand is traceable to the automotive industry indirectly, from partsmakers. Automotive business is increasing.

## Metallurgical Coke

**Coke Prices, Page 71**

Beehive coke for metallurgical purposes is unchanged. Buyers of furnace coke are paying around $3.25 per ton, and in some cases as low as $3, but there have been sales at $3.50. On common foundry grades the market is considered $4 a ton, Connellsville, Pa. oven base, and premium grades are around $5. The foundry melt in the Pittsburgh district is improving to a point where more coke is being taken in, but blast furnace requirements appear to be somewhat less. Chicago suppliers have extended the price on by-product foundry coke into August without change. July deliveries were slightly under those of June but larger than in July last year. Demand at Cincinnati is steady and the price has been extended into August. St. Louis melters have decreased demands for coke on account of the hot weather, but are taking more than a year ago. At Birmingham, Ala., the situation is unchanged.

# Pig Iron

**Pig Iron Prices, Page 72**

**Pittsburgh**—Proportionately heavy volume of pig iron is being required for the manufacture of plate glass rolls in this district. Volume of plate glass manufacture during the first six months of this year reached the highest point for a similar period in its history—in excess of 88,000,000 square feet, compared with 48,000,000 in 1934. An increased need for pig iron is seen in the announcement last week that production had started at Bendix-Westinghouse Automotive Air Brake Co., Wilmerding, Pa., on a new type of air brake, designed for the lighter commercial motor carriers. Base price on foundry pig iron remains $18.50, Pittsburgh district furnace; basic is being quoted $18, and bessemer, $19.

**Cleveland**—Merchant pig iron sales in July were 25 per cent larger than in June, while shipments were 15 per cent more than in June. Specifications indicate further improvement in shipments this month. A northern Ohio merchant interest booked 5000 tons in the week. More inquiry is noted from machine tool builders, pump and heating equipment manufacturers, tractor builders. The automobile industry, however, continues to lead in tonnage. Substantial tonnages have been placed for the 5125 Chesapeake & Ohio freight cars recently awarded. Prices are steady.

**Chicago**—Pig iron shipments during July made a better showing than was anticipated and the total for the month was little changed from that of June, although a decrease of 15 to 20 per cent had been forecast. An increase in deliveries is in prospect for August as a result of gains in foundry operations the past few weeks. Machinery interests have shown a definite gain in schedules, a number of machine tool builders running at capacity, while tractor plants also are maintaining full schedules. The market holds at $18.50, furnace, for No. 2 foundry and malleable.

**Boston**—Pig iron sales, in small lots, are at firm prices for domestic grades, although the total tonnage is light. Substantial inquiry is lacking and most of the larger consumers are stocked with supplies covering operations at the present rate for some weeks. Casting requirements for machine tool builders are heavier.

**New York**—Pig iron is moving briskly, considering the season of the year. Shipments last month appear to have been a shade heavier than in June and in view of the general improvement in iron and steel business, the expectation is that this month may see even a better tonnage released. Two eastern furnaces, one at Tonawanda, N. Y., and the other at Troy, N. Y., are reported to have been blown in this past week. Nothing definite has been decided with regard to resumption of activities at the Riddlesburg, Pa., furnace, although latest indications are it will not be much before Oct. 1. The stack is expected to be ready for operation by Sept. 1, however.

**Philadelphia**—Pig iron shipments are holding, with the movement of last month apparently better than


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in the preceding month. Buying is still confined largely to carlots, with no disposition on the part of consumers to buy ahead. As this policy has now long been in effect, foundries and other consumers have relatively little stock on hand. An important exception is some of the larger district cast pipe makers. At the rate of present consumption, these interests, it is said, could run along throughout the remainder of the year without replacements. Domestic prices are steady.

**Buffalo**—The long-idle stack of the Tonawanda Iron Works went into blast Aug. 1, slightly ahead of original plans. This gives the district seven active furnaces, the highest total operated in years. Nevertheless, new pig iron business is quiet, with only a few sizable lots moving.

**Youngstown, O.**—Pig iron continues to move slowly in this district. Only small lots are being taken. The market lacks outstanding feature. Prices continue strong at established levels.

**Cincinnati**—July shipments of pig iron were close to the June tonnage, chiefly on contract specifications. New buying is being held to spot orders for a market total of about 750 tons weekly. Quotations on both northern and southern iron, in which demand has tapered slightly, are firm.

**St. Louis**—Preliminary estimates place total shipments of pig iron in this area during July somewhat higher than in June and the largest for the month since 1929. As has been the case for the past several weeks, buying is well diversified, but bulk of current business is being placed by the specialty makers, especially the implement, tractor, stove and machinery manufacturers.

**Birmingham, Ala.**—But little improvement is noted so far, though several melters reiterate statements better conditions are seen ahead. Four blast furnaces are in operation on foundry, two on basic. Woodward Iron Co. is spending upward of $230,000 on improving and increasing output of one furnace.

**Toronto, Ont.**—New business continues slow. While demand is holding steady at the level of the last few weeks, no large orders have appeared. Production is holding, with three stacks blowing. The daily melt is reported at approximately 45 per cent.

## Tin Plate

**Tin Plate Prices, Page 70**

**Pittsburgh** — Tin plate producing operations have been maintained for the second consecutive week at 88-90 per cent of capacity. Rate of fresh specifications for tin plate has not diminished, and beer can prospects, as well as those for bumper canning crops this year, are distinctly favorable market factors. The tin plate market is remaining $5.25 per base box, Pittsburgh.

**New York**—Tin plate buying has sagged considerably, but it is believed it will be the latter part of August before this is reflected in production.

**Youngstown, O.**—An active demand for tin plate continues. Can-makers and other container manufacturers are furnishing a heavy volume of business. Tin plate is firm at $5.25 per base box, Pittsburgh.

## Scrap

**Scrap Prices, Page 73**

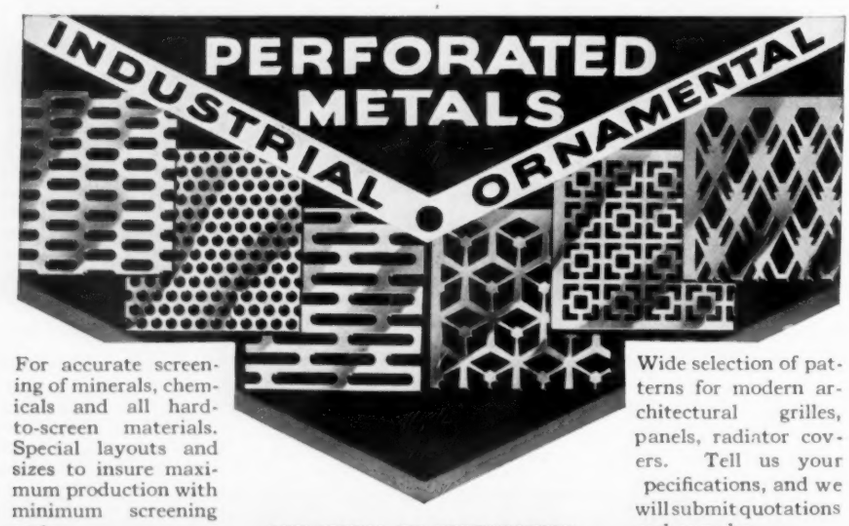
**Pittsburgh** — Supported by general buying interest the scrap market continued to maintain a strong undertone through last week. Ordinary No. 1 heavy melting steel remains quotable at $13 to $13.50 and railroad heavy melting at $13.50 to $14, both levels being confirmed by purchases. Scrap supplies of secondary holders are tightly held, and the market shows evidence of movement in only one direction, upward. Turnings here are now quotable at $7 to $8, machine shop turnings, $8.75 to $9.25, and railroad specialties, $15 to $15.50. Lists from the Baltimore & Ohio, Aug. 5, and the Pennsylvania, Aug. 7, are for sale.

**Cleveland**—Optimism of dealers concerning steel operations seems the chief reason for almost continuous shifting of scrap prices to higher ground. Most prices are still to be tested by actual sale as demand continues light. Heavy melting No. 1 is quoted $11.75 to $12.25, up 75 cents from last week.

**Chicago** — Heavy melting steel has advanced 50 cents, to $11.50 to $12, on a sale at the latter figure, extending the rise for the past two weeks to $1.50. Offerings of dealers and brokers have matched the upturn in the consumers' market because sellers find little material available at less than $12, this bid being fairly general on coverage of old orders and in speculative buying. Only a small increase in available scrap is noted as a result of the recent price advance, a number of holders refusing to sell in anticipation of still higher quotations.

**Boston** — Scrap prices are higher on several grades, including iron car wheels, heavy cast, forge flashings, skeleton and machine shop turnings. The Worcester, Mass., steel works has paid $6.50, delivered, for skeleton and offered $8, delivered, for heavy melting steel. For export heavy melting steel prices are unchanged and shipments are lighter, although buying continues steady against contracts to go out later this month. Shipments to Pennsylvania are slightly stronger.

**Philadelphia** — No. 1 steel has again advanced to a spread of $10.50 to $11, delivered, with buying of a fair-sized tonnage at this range by a Claymont, Del., consumer. Railroad wrought has advanced to $11 to $11.50, delivered, consuming

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point, No. 1 forge steel to $10.50 to $11, and new compressed sheets to $10 to $10.50. These latter changes, however, are largely nominal. Other grades, including No. 2 melting steel, are unchanged, although the general undertone is strong.

Export prices also are unchanged, but nominal as they are now out of line with the domestic market. Trade opinion appears to lean to the possibility that these present export prices here will gradually fade, in view of the stronger domestic market and tapering demand from abroad.

**Buffalo**—The local scrap market is strong, not because of consumer purchasing, but reflecting strength of outside markets. With No. 2 steel quoted at better than $12 Youngstown, O., Buffalo dealers can ship into that territory, and are freely predicting that no considerable amount of No. 1 steel can be purchased here now for less than $12. Stockpiles of Buffalo steel mills are reported to be depleted by the consistent summer operation, and with a busy fall indicated it is regarded as fairly certain further buying is imminent.

**Youngstown, O.**—Considerable uncertainty prevails in this market. Little material is moving to the local mills since they are well covered. However, the tone of the market is strong and some dealers are asking up to $14 for No. 1 heavy melting. So far as can be learned nothing has been placed at that level.

**Detroit**—Open-hearth grades have moved up 25 cents but blast furnace grades were stationery here last week. Generally, the market continues strong, but it is largely a dealers' one. Most mills are holding off, preferring to take the chance of paying higher prices when need arises. Automotive offerings of scrap are lighter, seasonally.

**Cincinnati**—In a dealers' market, prices on iron and steel scrap show another advance, heavy melting steel now being quotable at $8.50 to $9. Mills show no apparent interest in tonnage purchases at current, higher prices. Bids on railroad material are substantially higher than last month, for material into this district, and dealers are holding supplies tightly.

**St. Louis**—Continued strength and additional price advances have marked iron and steel scrap. Strength is due largely to sympathy with eastern markets, speculative activities on the part of dealers and general paucity of offerings. Melters are purchasing sparingly. Mills would like to take on substantial tonnages but are unwilling to follow the recent price advances.

**Birmingham, Ala.** — Continued slowness is reported in the iron and steel scrap market, heavier melters of heavy melting steel not buying, pipe makers taking a little tonnage of cast and steel and others buying a car now and then of other grades.

**Seattle**—Exporting houses report no change, although the ocean space situation is clarifying with resumption of lumber shipments. Japan still is holding off and prices are proportionately weak. Dealers are replenishing stocks in preparation for renewed demand from the Orient.

**Toronto, Ont.**—Trading in iron and steel scrap is quiet. Local dealers continue to make shipments of heavy melting steel and iron grades to the Hamilton district. Sales of approximately 200 tons of wrought scrap were reported for the week while several contracts for small lots of cast scrap were closed. Dealers are not bidding for scrap and prices are unchanged.

# Warehouse

**Warehouse Prices, Page 74**

**Pittsburgh**—Jobbers here in July moved more steel from store than in any month since March. Warehouse prices are steady and unchanged.

**Cleveland**—July orders and tonnage were lower than those of June for warehouses in this district. Prices are steady.

**Chicago**—July warehouse sales showed a slight increase over those of June and a larger increase compared with July a year ago. Buying continues well diversified and the immediate outlook remains favorable. Prices are unchanged.

**Boston**—Warehouse sales during July compared favorably with the previous month, jobbers in a few instances reporting increases, notably with the machine tool trade. Buying is well distributed. Jobbers are not placing business with mills far in advance, but are ordering frequently, in line with their own sales.

**New York**—Sales with most jobbers closed strong last week with July volume about 10 per cent better than June with some warehouses. Increased number of small well-distributed orders was responsible. There is less open shading on sheets than two weeks ago.

**Philadelphia**—While seasonally light, jobbing demand is fairly sustained. Most jobbers report July tonnage about on a parity with June or possibly a shade better. Prices continue unchanged, although mill revisions in extras on bars scheduled to become effective Aug. 10 will probably result in some changes out of warehouse later.

**Detroit**—July business of Detroit warehouses was greater than that of June and also last July. While automotive work accounted for a good share of this showing, nevertheless general improvement was manifest. Industrial rehabilitation, including convevor systems, is brisk. Prices are steady.

**Cincinnati**—A slight slump during the last week of July pulled down warehouse tonnage to a level with June. Prices are unchanged.

**St. Louis**—Following the usual trend, warehouse bookings in July


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were slightly greater than in June, and well over July a year ago. Country machine shops and distributors have been heavy purchasers for the past several weeks. Prices remain unchanged on all standard commodities.

**Seattle**—Business has improved with settlement of the logging and lumber strike. Purchases, however, are in small lots. The trade anticipates considerable momentum when the federal agencies approve submitted projects.

## Bolts, Nuts, Rivets

**Bolt, Nut, Rivet Prices, Page 71**

Specifications and shipments of bolts, nuts and rivets were slightly heavier in July than in June in the Pittsburgh district. Most orders were for small amounts, specifying prompt shipment. The few prominent inquiries before the trade at present include an inquiry from the Chesapeake & Ohio railroad for screw spikes and the requirements of car shops to build 5125 freight cars for Chesapeake & Ohio. Bids on 5500 pounds of buttonhead rivets were opened late last week by the federal engineers at Pittsburgh. The market is nominally 70-10-5 off list, but weaknesses of one to two extra 10's off list are reported. Large rivets are steady at 2.90c, Pittsburgh and Cleveland, 3.00c, Chicago.

Railroad demand in the Chicago district has been less than had been expected but total sales there in July were better than in June.

At Cleveland little change was noted in the volume of nut and bolt orders for the week. The outlook, however, is considered more favorable, as manufacturers expect larger specifications as soon as the automobile and parts manufacturers which have suspended for vacations and inventories resume operations.

## Cold Finished

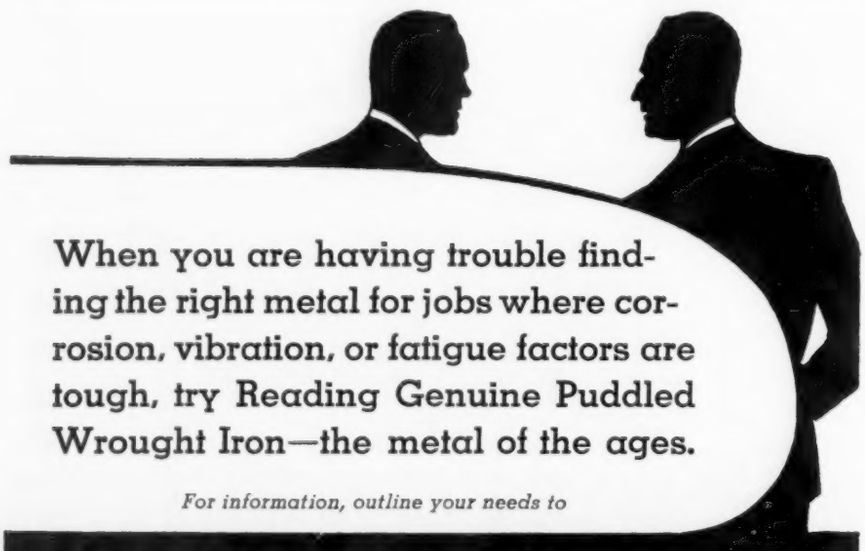
**Cold Finished Prices, Page 71**

**Pittsburgh**—Following revision in certain size extras on hot-rolled bars, it is reasonable to expect that the cold-finished bar industry will make some comparable change. The market, from the standpoint of new orders, is active and improving, the result being that producers have larger backlogs now on which to operate and expect additional tonnages to be placed by automobile makers. The market is based on 1.95c, Pittsburgh.

## Semifinished

**Semifinished Prices, Page 71**

Skelp and sheet bar stocks in the hands of nonintegrated steel mills have continued to expand. Apparently many buyers are more willing to augment their inventories than at any time previously this year. This condition in turn indicates conviction that business in finished products will improve over the balance of the year. Base prices on common wire rods at $38 a ton, Pittsburgh; on sheet bars at $28, and on billets, blooms, and slabs at $27 a ton are without change.

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SCIENCE AND INVENTION HAVE NEVER FOUND A SATISFACTORY SUBSTITUTE FOR GENUINE PUDDLED WROUGHT IRON


## Iron Ore

**Iron Ore Prices, Page 73**

**Cleveland**—Vessel shipments of Lake Superior iron ore in July totaled 4,460,536 tons, only 28,396 tons more than in the month last year. For this season to Aug. 1, the total is 12,606,029 tons, 9.3 per cent more than in the comparable period last year. While the market is quiet, producers expect some additional buying in the fall.

## Steel in Europe

**Foreign Steel Prices, Page 74**

**London**—(*By Cable*)—Activities in the steel and iron markets of Great Britain are well maintained. Order books of Middlesbrough blast furnaces are filled for three months on foundry iron. Dorman, Long & Co. Ltd. have booked an order for 2500 tons of steel plates for Russian delivery. The Continental cartel is resuming transactions in the British market. Exports of galvanized sheets are dull but movement of tin plate is fair, especially to South America.

The Continent reports export trade slightly better. It is reported Poland has joined the steel cartel, and that the international railmakers association has been renewed for five years.

## Coke By-Products

**Coke By-Product Prices, Page 71**

**New York**—Sulphate of ammonia prices have been reaffirmed at $24 per ton, f.o.b. Atlantic or Gulf ports with $22, f.o.b., northern producing ovens, the latter being a reduction of $2 at ovens. These prices apply through August to June, 1936. Distillates are in good demand with current production going directly into consumption. Naphthalene is dull with buying confined to spot lots.

## Nonferrous Metals

**Nonferrous Metal Prices, Page 72**

**New York**—Lead advanced $1 a ton and zinc $2 a ton Friday to feature nonferrous metals last week. The undertone of copper and tin continued firm. Trading in all metals was generally light.

**Copper** — Sales jumped sharply Wednesday to 2096 tons, making the July total 73,488. This was the largest amount of business reported for any month since 1929. All first hands continued to hold prices firm

at 8.00c, Connecticut, while resale copper in the outside market was still available at 7.87½c to 8.00c, Connecticut. Copper abroad gained strength as the week progressed and closed around 7.85c to 7.90c, c.i.f. European ports.

**Lead** — Demand for lead was active toward the end of the week which resulted in all leading sellers raising quotations to 4.20c, New York, and 4.05c, East St. Louis. St. Joseph Lead continued to ask $1 premium on the New York market for certain brands. Some observers expected further advances to develop this week.

**Zinc**—The $2 advance in zinc prices to 4.50c, East St. Louis, reflected the well sold position of sellers and the $1 boost in ore prices. The market was firm at the higher level. Sellers were reluctant to do business for delivery beyond September and October at current prices.

**Tin**—Trading was dull but prices held steady around the 52.50-cent level. Spot tin supplies continue restricted.

**Antimony**—Only a little small lot business was reported done but prices advanced to 13.00c, duty paid, for Chinese spot.

## Quicksilver

**New York**—Quicksilver prices continue slightly easy in a quiet market. Round lots of 100 virgin flasks are quotably $70 a flask with small lots of 15 to 24 flasks, inclusive, at $71 to $71.50.

# Activities of Steel Users and Makers

CARBORUNDUM CO., Niagara Falls, N. Y., has bought the personal assets and goodwill of the Hutto Engineering Co. Inc., Detroit, manufacturer of cylinder honing and grinding tools and machines. Operations of the Hutto company will be continued and expanded as a division of the Carborundum company, to be known as the Hutto Machine Division. Production will be carried on at the present modern Hutto plant, 515 Lycaste avenue, Detroit. The present management is being continued, with Joseph A. Carlin manager and John E. Kline chief engineer.

♦ ♦ ♦

A. W. Cash Co., Decatur, Ill., has appointed Gale Engineering Co., 136 Liberty street, New York, its representative in that territory for its combustion control division. George W. Gale, head of the Gale company, was associated until recently with L. J. Wing Mfg. Co., New York.

♦ ♦ ♦

S. R. Dresser Mfg. Co., Bradford, Pa., manufacturer of pipe couplings, has more orders on books than at any time for several years.

♦ ♦ ♦

Thermador Electrical Mfg. Co., Los Angeles, has moved its plant from 116 Llewellyn street to 2821 East Pico street.

♦ ♦ ♦

M. M. Griest Co., Keenan building, Pittsburgh, has been appointed exclusive distributor for domestic by product coke produced by Wheeling Steel Corp., Wheeling, W. Va.

♦ ♦ ♦

Thamesville Metal Products Co., Thamesville, Ont., newly organized, has opened a plant in Wallace street for production of steel wool and other products on a large scale.

♦ ♦ ♦

Allegheny Steel Co., Brackenridge, Pa., has shipped two speed rings for two 66,000 horsepower turbo generators in the Norris dam power plant of the Tennessee valley authority.

♦ ♦ ♦

John C. Vance Iron & Steel Co., Chattanooga, Tenn., has been sold by court order to John G. Kain, acting as agent for interests which plan reorganization and resumption of operation. The company has been in receivership for about 15 months.

♦ ♦ ♦

Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa., has been given a contract by the city of Los Angeles, bureau of power and light, for a 60,000 kv-a hydrogen-cooled frequency converter. It will be erected at Wilmington, Calif., to serve in interchange of power between the bureau of power and light and the Southern California Edison Co.

♦ ♦ ♦

William B. Pollock Co., Youngstown, O., manufacturer of steel plate work, has appointed Indol Products Inc., Packard building, Philadelphia, and 277 Broadway, New York, its eastern representative.

♦ ♦ ♦

Property of the Kempsmith Mfg. Co., Milwaukee, formerly manufacturer of milling machines, has been sold under foreclosure judgment to satisfy a mortgage bond issue made as part of a reorganization in 1926. The company has been out of production for several years. In 1931 the line of heavy-duty millers was sold to Jos. T. Ryerson & Son Inc., Chicago.

♦ ♦ ♦

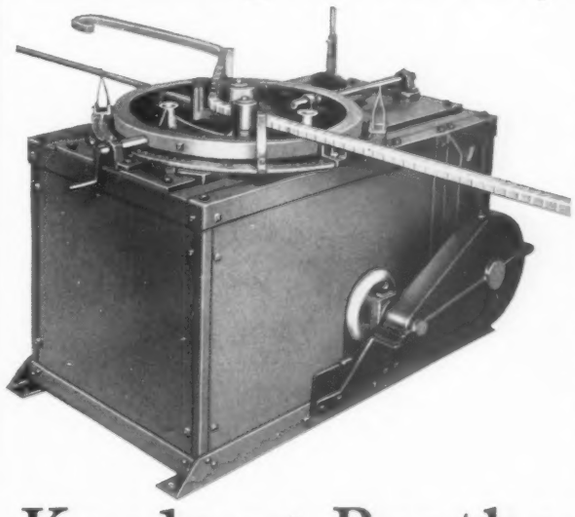
Morgan Construction Co., Worcester, Mass., has been awarded a contract for all the large roll neck bearings for backing rolls for the three-stand, four-high continuous cold strip mill for the American Rolling Mill Co., Middletown, O. Contract for the entire mill went to United Engineering & Foundry Co., Pittsburgh, which has given the Morgan company the bearings order. Morgoil flood lubricated bearings will be used.

♦ ♦ ♦

Fawcus Machine Division, Ford City, Pa., of Gears & Forgings Inc., advises that the machinery and equipment of


# Kardong Four-way Bender

## Model D-2



The Model D-2 Kardong Four-way Bender was designed because of the popular demand for this type of Bender.
In the bending of large bars they do not have to be turned over to make the reverse second bends and in the 180 degree hook bars, after making the first hook the bending member is in position to make second hook by just switching resistance roller to opposite side.
The resistance roller plates are adjustable. The same construction is carried thru on this machine as in all of our benders and is guaranteed to give absolute satisfaction. Ask for catalogue of our complete line of reinforcing steel bar benders.

# Kardong Brothers, Inc.

Minneapolis, Minn.

this plant will be liquidated for Thomas W. Ward Ltd., Sheffield, England, which recently purchased the division for $81,276. STEEL, July 22, Page 75, reported that the sale had been authorized by Federal Judge F. P. Schoonmaker at Pittsburgh. It is expected that liquidation will take from six to nine months.

♦ ♦ ♦

A. M. Castle & Co., Chicago, steel jobbers, have bought the property of the Liberty Iron Works, 1309 Fifty-ninth street, Oakland, Calif., and will open a sales department and steel warehouse about August 14. The company also has branches at San Francisco, Los Angeles and Seattle, on the Pacific coast. The new warehouse will have 30,000 square feet of floor space and opportunity for expansion.

♦ ♦ ♦

Rockwell Products Co., Hartford, Conn., recently organized, has elected Charles W. Deeds, Hartford, as president. He is vice president of United Aircraft Corp. Other officers include: Edward A. Rockwell, New York, vice president and E. L. Morgan, secretary and treasurer. Directors include Clayton R. Burt, president of Pratt & Whitney Co.; Charles Seymour, president of Niles-Bement-Pond Co.; J. B. Hayward, New York. The company will manufacture a power brake and other devices invented by Mr. Rockwell. The brake uses an electric hydraulic principle instead of air and vacuum.

♦ ♦ ♦

T. S. Gassner Co., 152 West Apsley street, Philadelphia, manufacturer of builders' sheet metal, alloy metal fabrication and stainless steel products, this year marks 85 years of business activity. It was founded by T. S. Gassner, and his son, T. S. Gassner Jr., continued the business. Maxwell R. Loechel became president in 1931. Recently the company took over manufacture of products of the H. D. Dougherty Co., manufacturer of metal furniture and beds for hospitals and hotels, which broadened its line of production. George B. Darby Jr. is general manager and purchasing agent for both companies. Formerly he was connected with Edward Darby & Son, Philadelphia, an old established metal manufacturing concern.

## Comparison of Earnings of Builders of Equipment, and Consumers of and Suppliers to Iron and Steel

All figures are profits, except where asterisk denotes a deficit.

| | Second Quarter, 1935 | Second Quarter, 1934 | First Half, 1935 | First Half, 1934 |
|---|---|---|---|---|
| National Acme, Co., Cleveland | $ 55,424 | ..... | $ 86,428 | $ 150,599 |
| Reynolds Spring Co., Detroit | ..... | ..... | 246,911 | 169,827 |
| Worthington Pump & Machinery Corp., Harrison, N. J. | ..... | ..... | *247,023 | *479,370 |
| Otis Elevator Co., New York | 61,152 | *43,173 | 114,690 | *295,224 |
| Kelsey-Hayes Wheel Co., Detroit | 633,792 | 338,652 | 1,140,221 | ..... |
| Westinghouse Air Brake Co., Wilmerding, Pa. | 78,878 | 313,757 | *95,372 | 42,034 |
| Borg-Warner Corp., Chicago | 1,627,486 | 1,085,435 | 3,011,332 | 1,950,528 |
| Universal Pipe & Radiator Co., New York | *12,898 | 16,059 | *118,442 | *17,939 |
| Eaton Mfg. Co., Cleveland | 436,688 | 435,405 | 1,041,960 | 776,556 |
| M. A. Hanna Co., Cleveland | 526,504 | 325,780 | 948,821 | 706,050 |
| Truscon Steel Co., Youngstown | *3,461 | 26,494 | *161,538 | *119,606 |
| Murray Corp. of America, Detroit | 674,630 | 52,161 | 1,202,621 | 280,771 |
| Hoskins Mfg. Co., Detroit | ..... | ..... | 198,078 | 174,863 |
| Holland Furnace Co., Holland, Mich. | *144,250 | *122,375 | ..... | ..... |
| Fairbanks-Morse & Co., Chicago | ..... | ..... | 376,990 | 22,228 |

| | Year ended June 30, 1935 | Year ended June 30, 1934 |
|---|---|---|
| Baldwin Locomotive Works, Eddystone, Pa., and subsidiaries, including Midvale Co. | *2,415,339 | *3,582,255 |

## Convention Calendar

**Aug. 19-23—American Foundrymen's association.** Thirty-ninth annual convention at Royal York hotel, Toronto, Ont. C. E. Hoyt, 222 West Adams street, Chicago is secretary.

**Sept. 9 — Associated Machine Tool Dealers.** Annual meeting at Hotel Cleveland, Cleveland. Harry Barney, Barney Machinery Co., Koppers building, Pittsburgh, is secretary.

**Sept. 11-21—National Machine Tool Congress (Third).** In Cleveland, under auspices of the National Machine Tool Builders' association; Machine Shop Practice division, American Society of Mechanical Engineers; and Production Activity division, Society of Automotive Engineers. Herman H. Lind, 1220 Guarantee-Title building, Cleveland, is general manager, National Machine Tool Builders' association.

**Sept. 11-21—National Machine Tool Exposition (Third).** In Public Auditorium, Cleveland, under auspices of the National Machine Tool Builders' association. Roberts Everett Associates, 232 Madison avenue, New York, are managers.

**Sept. 16-18—Iron and Steel institute (British).** Autumn meeting at Manchester College of Technology, Manchester, England. K. Headlam-Morley, 28, Victoria street, London, S.W.1, is secretary.

**Sept. 18-20—National Industrial Advertisers association.** Annual convention in William Penn hotel, Pittsburgh. Allan E. Beach, Littleford Bros., 453 East Pearl street, Cincinnati, is secretary.

**Sept. 20-21 — American Ceramic society.** Meeting of Refractories division at Pennsylvania State college, State College, Pa. Ross C. Purdy, 2525 North High street, Columbus, O., is secretary.

**Sept. 24-26—Association of Iron and Steel Electrical Engineers.** Annual convention and exposition at William Penn hotel, Pittsburgh. T. B.

Little, Empire building, Pittsburgh, is acting managing director.

**Sept. 30-Oct. 4—American Institute of Mining and Metallurgical Engineers.** Fall meetings of Iron and Steel and Institute of Metals divisions in Chicago. John T. Breunich, 29 West Thirty-ninth street, New York, is assistant secretary.

**Sept. 30-Oct. 4.—American Society for Metals.** Seventeenth annual National Metal congress at Palmer House, Chicago. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is secretary.

**Sept. 30-Oct. 4—American Welding society.** Fall meeting in Chicago. M. M. Kelly, 33 West Thirty-ninth street, New York, is secretary.

**Sept. 30-Oct. 4—National Metal exposition.** Seventeenth annual, in International Amphitheater, Chicago. W. H. Eisenman, 7016 Euclid avenue, Cleveland, is general manager.

**Sept. 30-Oct. 4—Wire association.** Annual meeting at Congress hotel, Chicago. Richard E. Brown, 17 East Forty-second street, New York, is secretary.

**Oct. 16-18—American Institute of Steel Construction.** Thirteenth annual convention to be held at Greenbrier hotel, White Sulphur Springs, W. Va. V. G. Iden, 200 Madison avenue, New York, is acting secretary.

**Nov. 12-15—International Acetylene association.** Thirty-sixth annual convention at Hotel Cleveland, Cleveland. H. F. Reinhard, 30 East Forty-second street, New York, is secretary.

# Building Supplies July Steel Lift

(*Concluded from Page* 17)

total, whereas the proportion for the industrial-commercial type for July was 35 per cent. This private work classification does not include railroad structures, because much of this work has been financed by the government, nor does it include private schools or hospitals.

Returning to comparisons of July with June — from 1924 to 1934 there were only four years in which building contracts of all classifications, as measured by square foot area, increased in July. In 1931 the two months were almost even; in 1932 a very slight gain was recorded; in 1925 and 1929 there were substantial advances.

Automobile assemblies in July also came close to equaling the June record. With output for the last three days of the month estimated, the total was approximately 350,000, compared with 361,320 in June. Since 1922, the year in which compilations were started, July production exceeded that of June in only two years — 1924 and 1925, although it was very close in 1928.

In the past 16 years, freight car loadings in July exceeded those of June in only five years — 1919, 1920, 1926, 1928 and 1933.

A standard index of industrial production for the past 15 years, revised for seasonal variations, shows July ahead of June in seven years—1921, 1922, 1925, 1926, 1927, 1928 and 1933.

A strong rise in industrial activity, which had its counterpart in steel production, set in in March, 1933, as the New Deal got under way with a flourish. The steelworks operating rate moved up sharply to a peak of 58 per cent in the second week of the month, about 4 points higher than the highest point this year—in February. From then on, however, the descent was almost as rapid as the ascent — it was one time when a midyear rise failed to carry on the trend.

Now with many artificialities swept aside, the pentup demand of five years is coming to the top; recent improvement appears to be of more substance.

# Equipment

**Chicago**—Machinery and plant equipment business continues at an encouraging rate. Seasonal influences so far have had little effect upon activity in most lines, with July sales in most instances equaling or bettering those of both June and the corresponding month last year. Demand for machine tools is moderately active and fairly well diversified, though most purchases are confined to small individual lots. Small tool buying has been maintained better than was anticipated for this period, reflecting steady operations in a number of metalworking fields. Chicago is inquiring for a number of tools for the Cermak pumping station, including a lathe, shaper, drilling machine, drill presses, grinder, saw and miscellaneous equipment. Bids close Aug. 6. About 12 tools have yet to be placed for the Stickney, Ill., sewage disposal plant.

**Pittsburgh**—Jessop Steel Co., Washington, Pa., has announced the installation of two additional furnaces, one a thermostatically controlled annealing type, and the other an electrically operated melting furnace. Both installations were made, according to the company, to meet increased demand for tool and die steels. By last week Mesta Machine Co. had completed the construction of a new open-hearth furnace at its West Homestead, Pa., plant.

**Boston**—Machine tool sales continue at the current rate with orders for one or two tools at a time from diversified industries steady. Substantial backlogs are held by more machinery builders, who in some instances, are being pushed for delivery. Ball and roller bearing manufacturers have been good buyers of equipment recently, one grinding machine company booking eight tools from three bearing shops. Additional automatic screw machines and lathes have been sold to automobile manufacturers.

**Seattle**—Demand for general items has improved with resumption of logging and lumbering. Important items are included in public works projects. Alaska is still actively in the market for dredging and mining equipment.

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# Construction and Enterprise

## Michigan

BENTON HARBOR, MICH. — Gray iron division of Benton Harbor Malleable Industries suffered damage by fire to its foundry, including patterns and equipment.

DETROIT—Mergraf Oil Refineries Inc., H. G. Holmes president, is building branch processing plants at New York and Los Angeles, each of 1,200,000 gallons annual capacity.

DETROIT—Ainsworth Mfg. Corp., 2200 Franklin street, manufacturer of automotive accessories, is having plans prepared by Albert Kahn Inc., Detroit, for a plant addition and powerhouse.

DETROIT—Kelsey Hayes Wheel Corp., 3600 Military road, is having plans drawn by Giffels & Vallet and L. Rosetti, architects, for a foundry building in McGraw avenue, Detroit.

DETROIT—Zenith Carburetor Co., 6645 Gratiot, is enlarging its plant at the foot of Hart avenue at a cost of $50,000. Leonard Willeke, 16934 Village Lane, is architect.

DETROIT—Acme Metalon Co., 9690 Greenley avenue, has been incorporated with 1000 shares no par value to manufacture metalon, by Marcus Ginsberg and associates.

GRAND RAPIDS, MICH.—Ottawa Industries Inc., recently formed as a subsidiary of Michigan Bumper Co., Grand Rapids, has taken over the plant and equipment of the Ottawa Mfg. Co., at Spring Lake, Mich., and will start at once the production of stamped metal automotive parts and trim. Clifford Anderson is in charge of the plant.

LOWELL, MICH.—John Arehart, Lowell, is general manager of a group of businessmen who are forming a company to establish a metal products plant, to manufacture sprayers and other devices. C. H. Runciman, R. D. Hahn and Frank N. Newell are other officers.

SOUTH HAVEN, MICH.—Terminal Co. will start soon on construction of a steel warehouse to replace the burned building on its docks. It will have capacity for 10,000 tons of steel.

## Connecticut

HARTFORD, CONN.—Rockwell Products Co. has been incorporated with capital of $1,000,000 to manufacture a new type of power brake and other devices. Charles W. Deeds, Hartford, vice president of the United Aircraft Corp., is president. Manufacturing space has been leased in the Pratt & Whitney plant at Hartford.

## Maine

BANGOR, ME.—Tidewater Oil Co., 17 Battery place, New York, will include in its 3,000,000-gallon bulk oil plant here two tanks of 875,000 gallons capacity and three of 395,000 gallons capacity. Cost will be over $100,000. (Noted July 15).

## New York

NEW YORK—Integral Steel Fabricating Co. has been incorporated to manufacture metal products, with capital of 100 shares no par value, by R. B. Brown, Tudor Towers, New York, and associates.

NEW YORK — Accurate Machinery Developers Inc. has been incorporated with 200 shares no par value to manufacture machinery, by Joseph B. Kaufman, 1350 Broadway.

NEW YORK—International Electromatic Corp. has been incorporated with $125,000 capital to manufacture machinery, by Sidney Kalfus, 51 Chambers street.

## New Jersey

MAHWAH, N. J.—American Brake Shoe & Foundry Co., 230 Park avenue, New York, has given a contract to the Austin Co., Cleveland, for a research laboratory here.

NEWARK, N. J.—Grammer, Dempsey & Hudson Inc. has been incorporated with $100,000 capital to manufacture steel and iron products, by Paul O. Grammer, 74 Warwick road, East Orange, N. J.

## Ohio

CLEVELAND—River Raisin Paper Co., Monroe, Mich., has leased part of the plant of the Peerless Co., East Ninety-third street and Woodland avenue, containing 40,000 square feet floor space, and will start production of corrugated paper and cartons about Sept. 1. Remodeling and equipment is under way. James Hamilton is manager.

DAYTON, O.—Structural Metal Products Co. has been incorporated with 250 shares, by W. F. Haynes, Earl Brown and Don Brown.

DEFIANCE, O.—Modern Equipment Corp., J. C. Markey president, recently formed to manufacture gasoline and service station equipment, with capital of $300,000, has started production.

## Illinois

CHICAGO—E. Edelmann & Co., 2332 West Logan boulevard, manufacturer of automotive specialties, is building a reinforced concrete addition to add 25,000 square feet to its plant, at cost of about $75,000.

CHICAGO—Pickus Engineering & Construction Co. Inc., 33 South Clark street, room 1013, has been incorporated with 200 shares common stock to engage in the construction of roads, by Louis S. Cohn, First National Bank building, and associates.

CHICAGO—Midwest Store Fixture Co., 18 South Throop street, has been incorporated with 150 shares common stock to manufacture store and office fixtures and equipment, by Albert B. Verb, 134 North LaSalle street, room 614, Chicago.

EAST ST. LOUIS, ILL.—Granite City Steel Co., Heyward Niedringhaus, president, plans expenditure of $4,000,000 for improvements and modernization, an increase in capital from 262,945 shares to 400,000 shares having been approved.

FARMERSVILLE, ILL.—City is having plans prepared for construction of a modern waterworks system.

OTTAWA, ILL.—Libbey-Owens Glass Co. will rebuild and equip its plant here for the manufacture of laminated safety glass, it is announced by John D. Biggers, president.

WAUKEGAN, ILL.—Brintbury Mfg. Co., 1810 Belvidere avenue, has been incorporated with 1000 shares no par value to manufacture automotive parts and accessories, by Charles F. Baker, First National Bank building, Waukegan, Ill.

## Indiana

EVANSVILLE, IND. — East Dayton Tool & Die Co., William Schleman, Dayton, O., owner, will build a plant here to cost about $30,000.

## Maryland

BALTIMORE—Crown Cork & Seal Co., Charles McManus president, plans production of a new type metal container for which production machinery is being built and plant constructed.

HAMPSTEAD, MD.—City, John M. Shank, clerk, is having surveys made for $35,000 waterworks plant, including 100,000-gallon steel tank and tower, pump, mains and reservoir.

## Louisiana

BATON ROUGE, LA.—Gulf Refining Co. is receiving bids for three oil storage tanks on property of the Louisiana & Arkansas railroad, Perkins road, each of 100,000 gallons capacity, with garage and storage rack.

## Mississippi

JACKSON, MISS.—Southland Cotton Oil Co., Mill and Fortification streets, will build a cottonseed oil house, 180 x 190 feet, of corrugated sheet metal.

## Florida

GRACEVILLE, FLA.—J. M. Kirkland will rebuild burned cotton gin plant, installing four 80-saw Continental gin heads and electric motors.

PENSACOLA, FLA.—American Oil Co. has been given permission to construct tanks and other structures at Barrancas avenue and Bayou Chico.

TAMPA, FLA.—Tampa Shipbuilding & Engineering Co., Ernest Kreher president, will resume construction of a $1,000,000 floating dry dock started last year on a loan of $750,000 from PWA.

TAMPA, FLA. — American Can Co., Frank D. Troop, First National Bank building, Baltimore, representative, will build a plant at First avenue and Twenty-second street on a 20-acre site, six units, main factory 185 x 536 feet.

## South Carolina

COLUMBIA, S. C.—Approval has been given the Santee-Cooper river power and navigation project to cost $37,500,000; grant of 45 per cent has been given, with remainder a loan. Burnet R. Maybank, Charleston, S. C., is chairman of authority for the project. Murray & Flood, 369 Lexington avenue, New York, are engineers.

## Tennessee

CHATTANOOGA, TENN.—John G. Kain, agent, has bought for a client the plant of the John C. Vance Iron & Steel Co., 1108 Carter street; company may be organized to operate.

McKENZIE, TENN.—Quick Tool Mfg.

(*Please turn to Page 94*)

# WHERE-TO-BUY

**A classified list of advertisers according to products. ¶Index to advertisements gives page number of any advertiser.**

**ABRASIVES (Polishing)**
Carborundum Co., The, Niagara Falls, N. Y.
Norton Co., Worcester, Mass.

**ACCUMULATORS**
Morgan Engineering Co., The, Alliance, O.

**ACETYLENE**
Air Reduction Sales Co., 60 East 42nd St., New York City.
Linde Air Products Co., 30 E. 42nd St., New York City.

**ACID-PROOF LININGS**
Ceilcote Co., The, Rockefeller Bldg., Cleveland, O.

**ACIDS (Pickling)**
American Chemical Paint Co., Ambler, Pa.

**AIR COMPRESSORS—See COMPRESSORS (Air)**

**ALLOYS—See FERROALLOYS**

**ANGLES, CHANNELS—See BEAMS, CHANNELS, ANGLES**

**ANGLE IRON BENDERS**
Excelsior Tool & Machine Co., Ridge and Jefferson Aves., East St. Louis, Ill.

**ANNEALING BOXES**
Union Steel Casting Co. 62nd & Butler Sts., Pittsburgh, Pa.

**ANODES (All Types)**
The Udylite Co., 1615 E. Grand Blvd., Detroit, Mich.

**AXLES**
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Standard Steel Works Co., Burnham, Pa.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.

**BABBITT METAL**
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.

**BANDS—See HOOPS AND BANDS**

**BANDS (Iron and Steel)**
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 So. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
The Stanley Works, New Britain, Conn. Bridgeport, Conn.

**BAR BENDERS**
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.

**BARGES (Steel)**
American Bridge Co., Frick Bldg., Pittsburgh, Pa.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
McClintic-Marshall Corp., Bethlehem, Pa.

**BARRELS (Plating)**
The Udylite Co., 1615 E. Grand Blvd., Detroit, Mich.

**BARRELS (Steel)**
Pressed Steel Tank Co., Milwaukee, Wis.

**BARS (Alloy)**
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Timken Steel & Tube Co., Canton, O.

**BARS (Concrete Reinforcing)**
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 S. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Youngstown Sheet & Tube Co., Youngstown, O.

**BARS (Iron)—See IRON (Bar)**

**BARS (Steel)**
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Laclede Steel Co., Arcade Bldg., St. Louis, Mo.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
The Stanley Works, New Britain, Conn. Bridgeport, Conn.
Tennessee Coal, Iron & Railroad Co., Brown Marx Bldg., Birmingham, Ala.
Timken Roller Bearing Co., The, Canton, O.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

**BEAMS, CHANNELS, ANGLES, ETC.**
Bethlehem Steel Co., Bethlehem, Pa.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Inland Steel Co., 38 So. Dearborn St., Chicago, Ill.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
Weirton Steel Co., Weirton, W. Va.
Youngstown Sheet & Tube Co., Youngstown, O.

**BEARINGS (Ball)**
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Norma Hoffmann Bearings Corp., Stamford, Conn.
New Departure Mfg. Co., Bristol, Conn.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.

**BEARINGS (Bronze)**
Cadman, A. W., Mfg. Co., 2816 Smallman St., Pittsburgh, Pa.
Cramp Brass & Iron Foundries Co., Paschall Sta., Philadelphia, Pa.
Rhoades, R. W., Metaline Co., 50—3rd St., Long Island City, N. Y.
Shenango-Penn Mold Co., Dover, O.

**BEARINGS (Journal)**
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Link-Belt Co., 300 W. Pershing Rd., Chicago, Ill.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.

**BEARINGS (Oilless)**
Rhoades, R. W., Metaline Co., 50—3rd St., Long Island City, N. Y.

**BEARINGS (Quill)**
Bantam Ball Bearing Co., South Bend, Ind.

**BEARINGS (Radial)**
Bantam Ball Bearing Co., South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
New Departure Mfg. Co., Bristol, Conn.
SKF Industries, Inc., Front St. and Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., Canton, O.

**BEARINGS (Roller)**
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Norma Hoffmann Bearings Corp., Stamford, Conn.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.

**BEARINGS (Roll Neck)**
Bantam Ball Bearing Co., The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Ryerson, Jos. T., & Son, Inc., 16th and Rockwell Sts., Chicago, Ill.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., Canton, O.

**BEARINGS (Roller Tapered)**
Bantam Ball Bearing Co., South Bend, Ind.
Timken Roller Bearing Co., Canton, O.

**BEARINGS (Rolling Mill)**
Bantam Ball Bearing Co., South Bend, Ind.
Cramp Brass & Iron Foundries Co., Paschall Sta., Philadelphia, Pa.
Hyatt Roller Bearing Co., P. O. Box 476, Newark, N. J.
Norma Hoffmann Bearings Corp., Stamford, Conn.
SKF Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., Canton, O.

**BEARINGS (Thrust)**
Bantam Ball Bearing Co. The, South Bend, Ind.
Fafnir Bearing Co., New Britain, Conn.
Norma Hoffmann Bearings Corp., Stamford, Conn.
S K F Industries, Inc., Front St. & Erie Ave., Philadelphia, Pa.
Timken Roller Bearing Co., The, Canton, O.

**BENDING AND STRAIGHTENING MACHINES**
Kardong Bros., 346 Buchanan St., Minneapolis, Minn.
Morgan Engineering Co., The, Alliance, O.
Thomas Spacing Machine Co., Pittsburgh, Pa.

**BENZOL AND TOLUOL RECOVERY PLANTS**
Koppers Construction Co., 1438 Koppers Bldg., Pittsburgh.
Youngstown Sheet & Tube Co., Youngstown, O.

**BILLETS (Alloy and Carbon Steel)**
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. La Salle St., Chicago, Ill.
Republic Steel Corp., Youngstown, O.
The Stanley Works New Britain, Conn. Bridgeport, Conn.
Timken Steel & Tube Co., Canton, O.
Washburn Wire Co., Phillipsdale, R. I.

**BILLETS (Forging)**
Alan Wood Steel Co., Conshohocken, Pa.
Andrews Steel Co., Newport, Ky.
Carnegie Steel Co., 327 Carnegie Bldg., Pittsburgh, Pa.
Illinois Steel Co., 208 S. LaSalle St., Chicago, Ill.
Jones & Laughlin Steel Corp., Jones & Laughlin Bldg., Pittsburgh, Pa.
Midvale Co., The, Nicetown, Philadelphia, Pa.
Republic Steel Corp., Youngstown, O.
Standard Steel Works Co., Burnham, Pa.
The Stanley Works, New Britain, Conn. Bridgeport, Conn.
Timken Steel & Tube Co., Canton, O.

(*Concluded from Page 92*)

Co. has been incorporated with $10,000 capital to manufacture tools, by L. C. Dinwiddie and associates.

McKENZIE, TENN.—Quick Tool Mfg. Co. has been incorporated with $10,000 capital, by L. C. Dinwiddie and associates.

MEMPHIS, TENN.—City plans to install electric motors, controls, conveyors, electric hoists and other equipment in the municipal elevator, the first unit of which will be for 1,500,000 bushels, at cost of $550,000. MacDonald Engineering Co., 1 North LaSalle street, Chicago, is engineer.

## West Virginia

GRAFTON, W. VA.—United States engineer, Federal building, Pittsburgh, will receive bids Aug. 19 for relocating tracks of the Baltimore & Ohio at Tygart river reservoir, near Grafton, including 960 tons reinforcing steel, 38 tons of structural steel, 64,900 feet of railroad track, and miscellaneous steel requirements.

ST. ALBANS, W. VA.—H. L. Lambert, Kanawha hotel, Charleson, W. Va., plans establishing a $1,000,000 distillery in the Roessler & Hasslacher chemical plant, two miles west of St. Albans, final negotiations for the site being under way.

## Virginia

NORFOLK, VA.—City council has voted appropriation of $14,000 for boiler and other equipment improvements at Thirty-seventh street pumping station.

NORTH GARDEN, VA.—Virginia Fruit Brandy Distilling Co., with capital of $100,000, has started construction of a plant for manufacture of distilled liquors, apple butter and jellies. E. C. Knight, Rural Retreat, Va., is president.

SALEM, VA.—Sanitary district of Roanoke county, James E. Palmer attorney, Roanoke, Va., plans construction of a $30,000 sewage disposal plant; votes August 27 on bond issue of $100,000. J. B. McCray Co., Atlanta, Ga., is engineer.

## Missouri

ST. LOUIS—Obear-Nestor Glass Co., East St. Louis, Ill., has let contract to Amsler-Norton Construction Co., Pittsburgh, for a $235,000 addition to its plant at Broadway and Southern railway tracks, to permit a 30 per cent increase in capacity.

ST. LOUIS—Mesker Bros. Iron Co., 427 South Seventh street, has bought a vacant site adjoining its plant to provide for expansion of operations.

## Oklahoma

ENID, OKLA.—C. H. Guernsey, engineer, 1216 Grand avenue, Cherokee, Okla., is making plans for $1,000,000 waterworks improvements, depending on bond election in August and PWA loan and grant. Includes pumps for 4,000,000 gallons per day and other mechanical equipment.

OKLAHOMA CITY, OKLA.—Ogletree Casing Pump Co. has been incorporated with $10,000 capital, by Louis F. Grieb, Povune building, and associates.

## Texas

ALICE, TEX.—City is seeking PWA loan and grant of $200,000 for construction of an electric light and power plant.

AUSTIN, TEX.—City, Guiton Morgan manager, is taking bids until August 12 for sewage disposal equipment to cost about $100,000. Bids for plant will be called after equipment contract is placed. J. E. Motheral is city engineer.

GAINESVILLE, TEX.—City plans to purchase 750-horsepower diesel engine for waterworks plant.

SHAFTER, TEX.—American Metals Co. is building a power plant, mill and air compressor at its Presidio silver mine to increase output to 250 tons daily.

## Wisconsin

ELKHORN, WIS.—City light and water commission will receive bids until Aug. 9 for an elevated steel water tank of 150,000 gallons capacity. Mead, Ward & Hunt, State Journal building, Madison, Wis., are engineers.

KEWAUNEE, WIS.—County board has voted to spend $40,000 for erection and equipment of a shop, garage and warehouse for the county highway department, starting at once. W. W. Tirner is chairman of the building committee.

MILWAUKEE—Schlitz Brewing Co., 235 West Galena street, is having plans made for a new powerhouse on North Second street. J. G. Scheier, care Schlitz Brewing Co., is architect.

MILWAUKEE—Geuder, Paeschke & Frey Co. has let contract for erection of a $25,000 shop addition at 1532 West St. Paul avenue to replace old frame structure.

MILWAUKEE—Louis Allis Co., manufacturer of electric motors, is completing work on a 1-story factory addition, 60 x 120 feet, expanding capacity to meet increased production demands.

MILWAUKEE—Heil Co., 3000 West Montana street, has let contract to Klug & Smith, Milwaukee, engineers, for a powerhouse addition, 30 x 35 feet, to cost about $40,000.

SHEBOYGAN, WIS.—City has engaged Jerry Donahue Engineering Co., Sheboygan, to design and supervise construction of a sewage disposal plant to cost $1,250,000. Federal grant of $562,500 has been applied for.

WESTBY, WIS.—Westby Mfg. Co. has been incorporated to manufacture spotlights by Herschel Bartels, Oscar Stigen and Charles H. Walters.

## Minnesota

CANNON FALLS, MINN.—Cannon Valley Milling Co. is making alterations to its plant, including new metal stack and changes in its power plant.

MINNEAPOLIS—B. F. Nelson Mfg. Co., manufacturer of roofing products, has started construction of a 1-story all-metal warehouse, 64 x 158 feet. Butler Mfg. Co., Minneapolis, manufacturer of metal buildings, is contractor.

MINNEAPOLIS — Minneapolis Gas Light Co. and Northern Natural Gas Pipe Line Co. have filed application with the war department for permission to construct a pipe line to carry natural gas across the Mississippi river to supply manufacturing plants in the Midway district.

SPRING VALLEY, MINN.—J. N. Osterud, village clerk, will receive bids until Aug. 15 for construction of a municipal electric light and power plant, including a diesel unit, to cost about $110,000. G. M. Orr & Co., Baker building, Minneapolis, are engineers.

ST. PAUL—Minneapolis-St. Paul sanitary district, 1923 University avenue, St. Paul, Milton Rosen secretary, will receive bids until Aug. 12 for construction of grit and screen chamber in sewage disposal plant to cost $80,000 and equipment $175,000.

## South Dakota

WESSINGTON SPRINGS, S. DAK.—City council is taking bids for an additional diesel unit of about 300 horsepower capacity for the municipal electric light and power plant.

## Iowa

WEBSTER CITY, IOWA—City plans to remodel the municipal gas plant at cost of about $35,000.

## Colorado

DENVER—Bids will be taken in August by the board of reclamation, Denver, on steel transmission towers and switchyard structures for circuits 2, 4 and 5 of the Boulder Dam power plant, specification 634.

## Montana

BILLINGS, MONT.—Petrie Tractor & Equipment Co. has been organized to deal in contractor's, industrial and mining machinery and equipment, by D. R. Petrie, president.

STEVENSVILLE, MONT.—A special election will be called soon to pass on a bond issue for a proposed $30,000 water system extension.

## Pacific Coast

GLENDALE, CALIF.—Plant of the Glendale Foundry & Mfg. Co. suffered damage by fire to extent of about $10,000.

LOS ANGELES—Hardesty Disc Bit Co. has been incorporated with $25,000 capital to manufacture tools, by Thomas M. Hardesty and associates.

LOS ANGELES—National Cable & Metal Co. has been incorporated with $10,000 capital to manufacture metal products, by Joseph C. Gilpin and associates.

LOS ANGELES—North American Aviation Inc., an affiliate of General Motors Corp., Detroit, will build a $500,000 plant at Los Angeles for building planes for the army and navy. J. H. Kindelberger is president.

STOCKTON, CALIF.—Golden West Laundry, Peter Wallace, owner, is being built and new equipment installed, at cost of $10,000.

SEATTLE—New Ray Light Inc., 1717 Broadway, has been organized to manufacture machinery, by Charles Lussier and associates.

SPOKANE—Washington Motor Coach Co. plans to erect a $25,000 garage and machine shop, for which bids will be called soon by L. P. Vowels, division superintendent.

SPOKANE—E. R. Hoffman, state PWA engineer, has given permission for Spokane to call for bids within 30 days for the proposed $687,000 dam and power plant on Spokane river for which $193,000 will be furnished by a PWA grant.

VANCOUVER, WASH.—Columbia Winery and Fruit Distilling Co. has awarded a contract to Fred Christenson & Co., Portland, Oreg., for the first unit of its plant, three stories, 40 x 90 feet. F. W. P. Schumann is secretary.